OLD!

retro GAMER

BOOK OF

ARCADE CLASSICS

- DISCOVER THE ORIGINS OF KEY GAMES
- HOW ARCADES RULED THE WORLD
- AMAZING DEVELOPER INTERVIEWS

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Welcome to

ARCADE CLASSICS

Back in the Seventies and early Eighties the arcade was king. While videogames were progressing at an astonishing rate in homes throughout the world, it was the arcade in the West and East where most of the biggest technical leaps and bounds were being made. Companies like Atari, Sega and even Nintendo were pushing specific hardware boards to create unique gaming experiences, many of which had never been experienced before. It was an exciting time, with all sorts of innovations appearing. While many of these classic games would appear on home systems, they were often pale shadows of the arcade originals, ensuring gamers in their thousands continued to flock to the many arcades that were found all around the world. The following pages celebrate that golden period by collecting some of the greatest content from the last decade of **Retro Gamer**. From the origins of *Space War* to the creation of *OutRun* and *Pac-Man*, this book will give you fascinating insight in to one of the gaming's most significant periods.

In association with retro GAMER magazine

ARCADE CLASSICS

Imagine Publishing Ltd
Richmond House
33 Richmond Hill
Bournemouth
Dorset BH2 6EZ
☎ +44 (0) 1202 586200
Website: www.imagine-publishing.co.uk
Twitter: @Books_Imagine
Facebook: www.facebook.com/ImagineBookazines

Publishing Director
Aaron Asadi

Head of Design
Ross Andrews

Editor
Darran Jones

Senior Art Editor
Greg Whitaker

Designer
John Ndojelana

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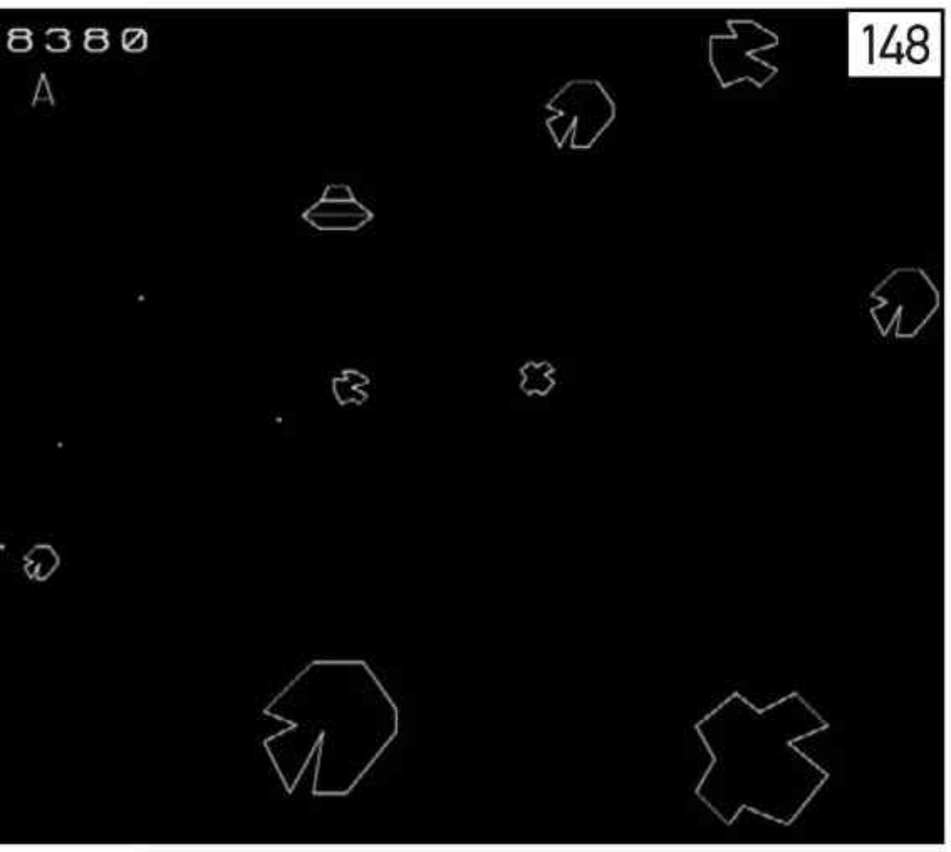

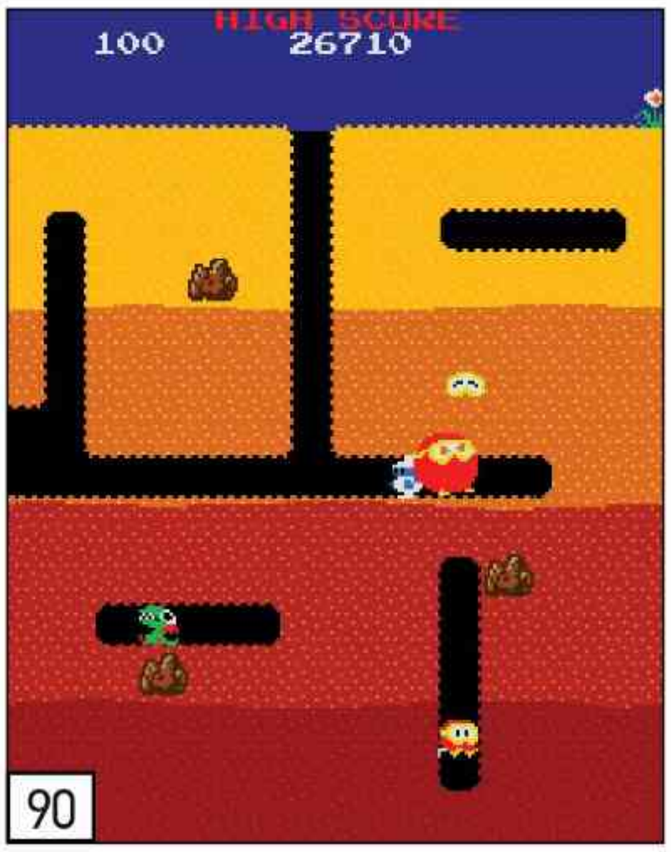

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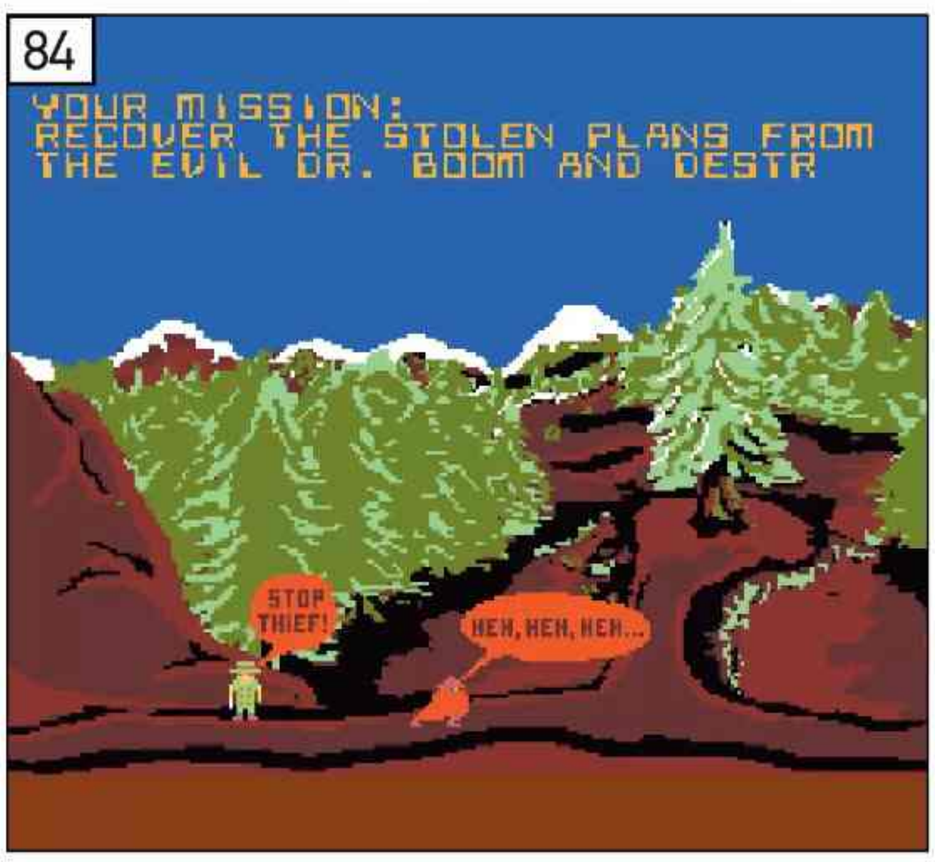

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No matter if you were the first kid on the street with an Atari 2600 or a Spectrum owner marvelling at Bob Pape's conversion of *R-Type*, it's clear that arcade games were the glue that bound the videogame industry together.

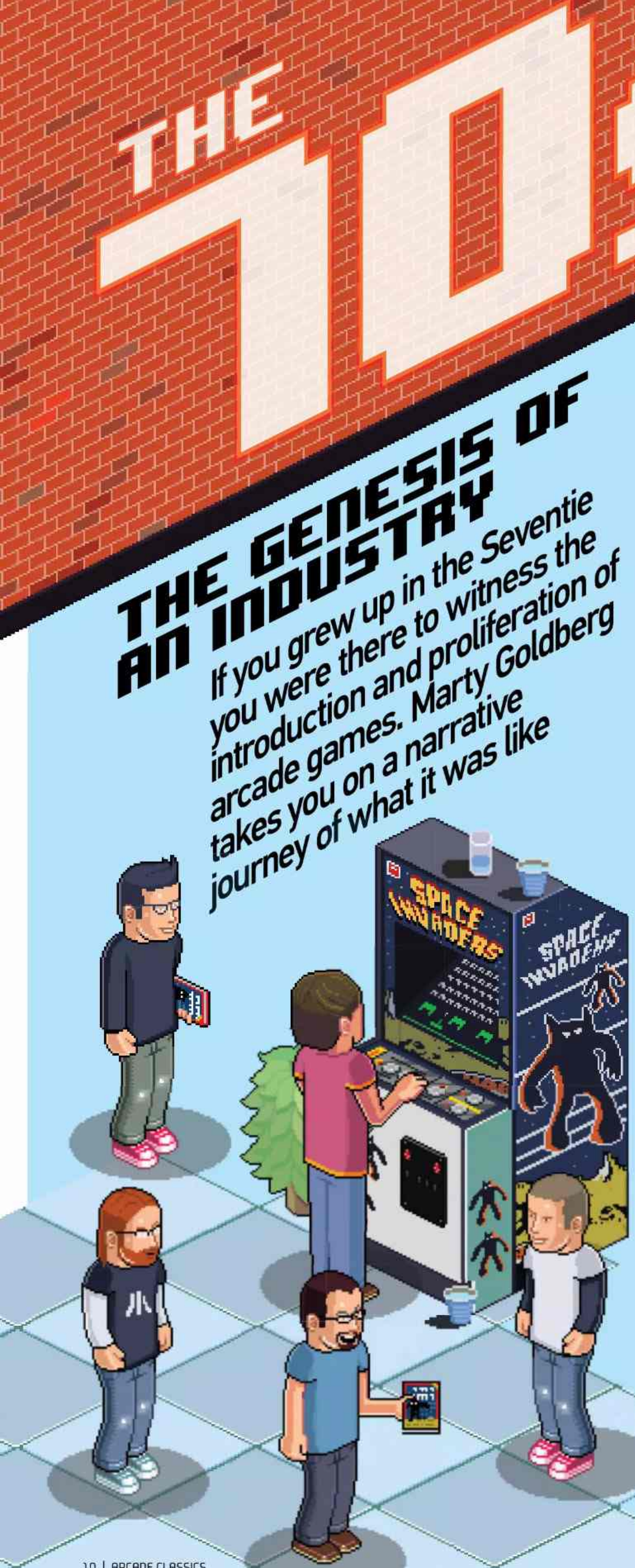
As soon as the success of Atari's *Pong* was established, arcade games became one of the key forces driving innovation in hardware and software within the videogame industry. For decades, the arcade was the only place to find truly cutting-edge gaming. Home computer and console games could only play catch-up with conversions.

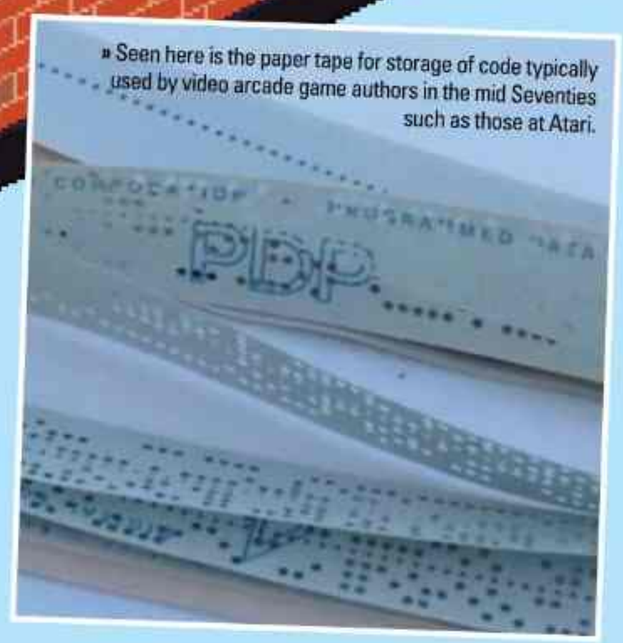
But it couldn't last forever. Changing player tastes and rapid advances in technology resulted in the swift decline of the arcade business in the 21st Century, but the market never died. From the early pioneers of the arcade business to those still making a living from coin-up gaming today, **Retro Gamer** has spoken to key players from the industry to bring you the history of arcade gaming. ▶

THE 70S

THE GENESIS OF AN INDUSTRY

If you grew up in the Seventie you were there to witness the introduction and proliferation of arcade games. Marty Goldberg takes you on a narrative journey of what it was like





» Seen here is the paper tape for storage of code typically used by video arcade game authors in the mid Seventies such as those at Atari.

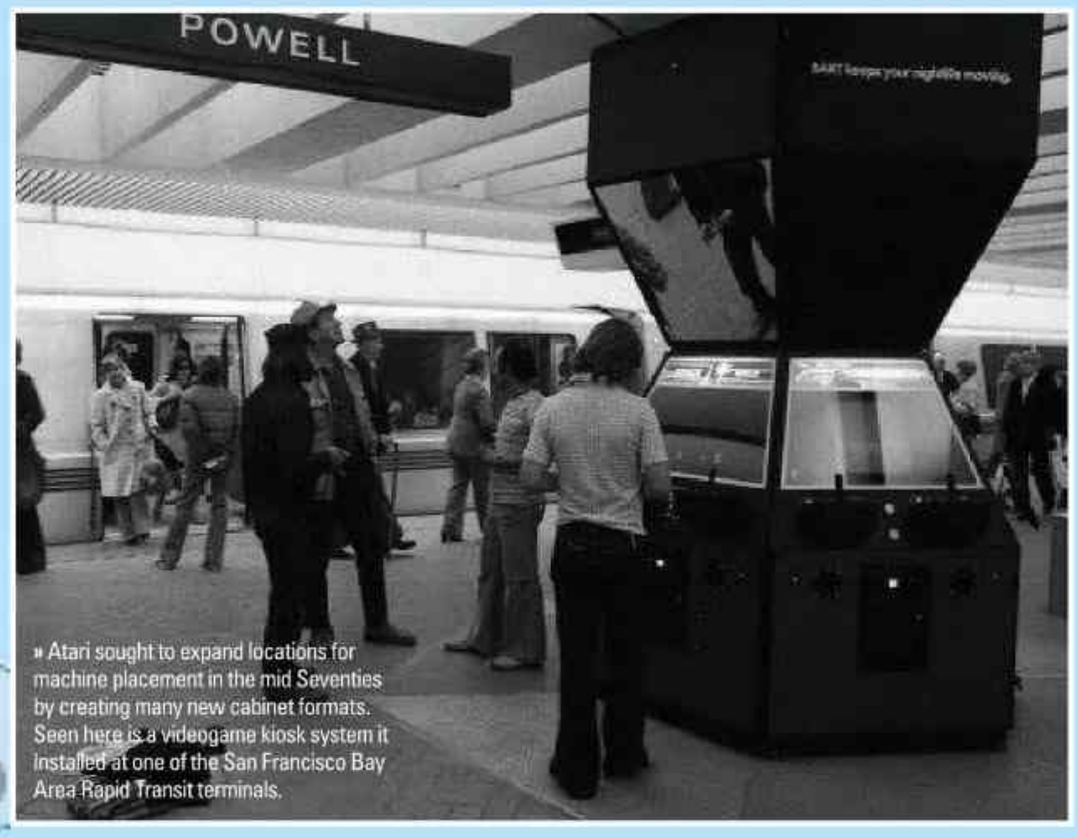
THE SEVENTIES ACTUALLY REPRESENTS AN INTERESTING PERIOD IN TIME FOR VIDEO ARCADE GAMES. ONE OF GROWTH AND PENDING DESTRUCTION. A DECADE THAT WAS SIMULTANEOUSLY A GENERATOR OF CRITICAL MASS FOR THE NEW MEDIUM WHILE ALSO WREAKING TOTAL HAVOK ON THE LONG ESTABLISHED COIN ENTERTAINMENT INDUSTRY.

The seed for this world influencing event had begun in 1969 when two office mates and friends at audio giant Ampex decided to pursue the one's vision of marrying computer technology and arcade gaming. Nolan Bushnell and Ted Dabney started to create a video arcade game based on an earlier computer game the two witnessed at Stanford called *Spacewar!*.

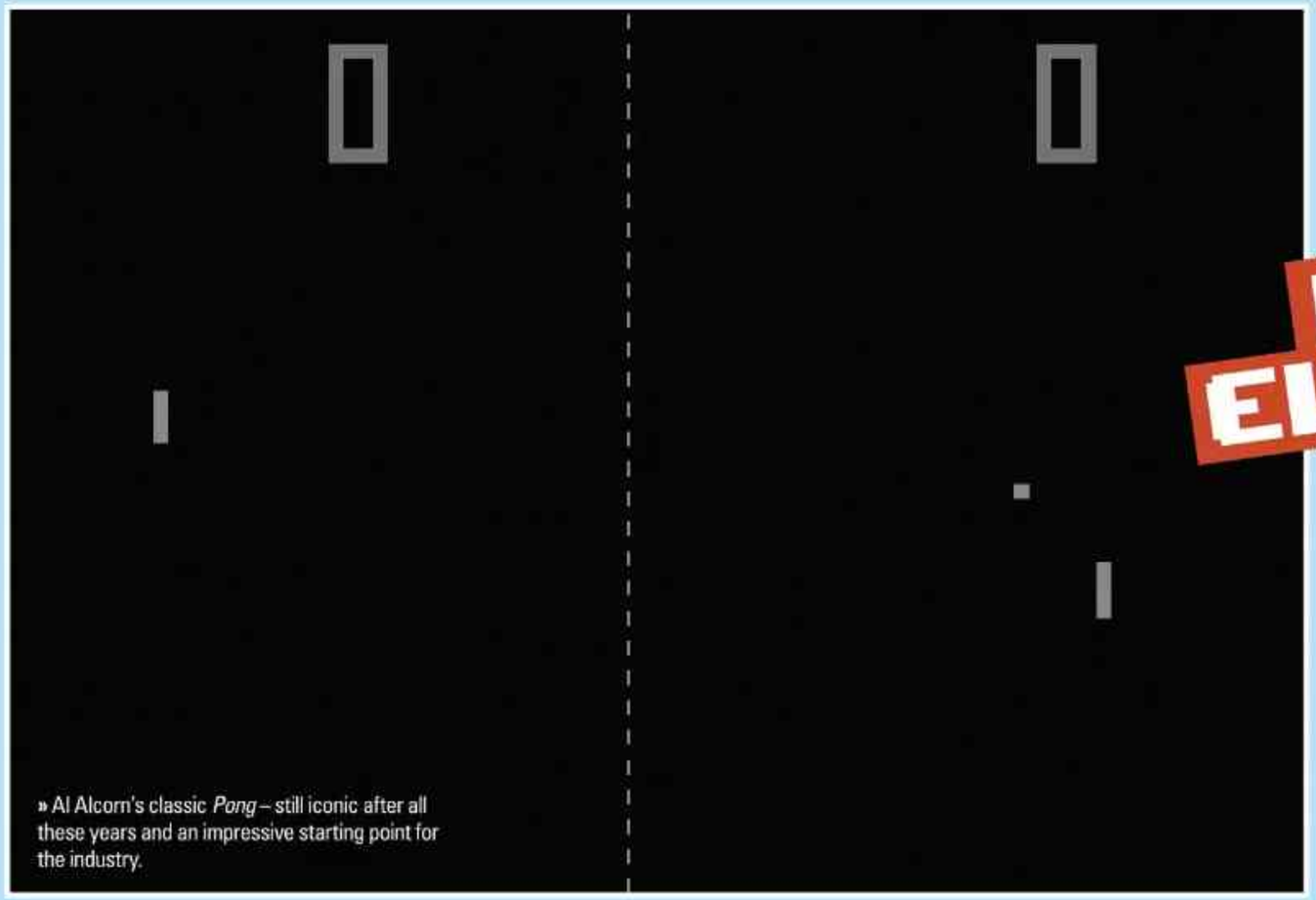
You have to understand what a novel if not naive concept this was, that two guys could come in and create an entirely new entertainment medium let alone to hope that it would gain any traction in the already established coin industry. First, they were out in California. This was a location about as far away from Chicago, the established mecca of the coin industry, as you could possibly be. Second, they'd have to convince an established coin company to take a chance on it. The industry at that time was dominated by companies that had already been around for decades like Williams, Gottlieb, Bally and Chicago Coin.

The games they were pumping out had been mainly pinball and gun based, though over the Sixties more specialised electro-mechanical (EM) games had gained popularity. Games based on simulations whose subjects would become popular as videogames almost a decade later. Ed Logg, creator of such videogame classics as *Asteroids*, *Centipede* and *Gauntlet* remembers his first exposure to these games: "The first time I played a coin-operated game was at the Berkeley Student Union. It was a game where you tried to shoot down bombers which appeared over the horizon. It wasn't a videogame because the planes appeared to be on a rotating piece of screen. There was a pattern so I could play the game for as long as I wanted."

There was also the uphill battle of the stigma arcades had in a lot of communities as a hotbed for raucous teenagers or in some cases organised



» Atari sought to expand locations for machine placement in the mid Seventies by creating many new cabinet formats. Seen here is a videogame kiosk system it installed at one of the San Francisco Bay Area Rapid Transit terminals.



» Al Alcorn's classic *Pong* – still iconic after all these years and an impressive starting point for the industry.

"My earliest memories of arcades were of shadowy places where naughty things might happen"

Al Alcorn

crime and gambling. As *Pong* creator Al Alcorn relates, "My earliest memories of arcades were of shadowy places where naughty things might happen. Besides the usual pinball machines and 'love' testers there were movie machines that showed graphic movies. At Playland at the beach there was the Fascination arcade, which was grey area gambling. These places were not for family entertainment."

Bushnell and Dabney's initial goal was to start a videogame engineering firm, researching and creating games to license to the big coin companies to produce. If you're asking why they were 'engineering firms', it's because the early arcade videogames were not coded – they didn't have a microprocessor. Rather they were what's called 'state machines', a grouping of electronic circuits that carried out various functions based on the input – in this case the game's controls. You'd have one circuit to put an object on the screen, another to move them, another to detect a hit, and so on.

They lucked out however, and found the one coin-op company based in California; Nutting Associates. Something of an upstart itself, Nutting had been formed by Bill Nutting after creating an EM-based quiz game called *Computer Quiz* with his brother Dave Nutting. Their initial partnership had quickly fizzled and Bill started Nutting Associates in California to sell the game while Dave started Nutting Industries in Milwaukee, Wisconsin to sell his version. Releasing a string of similar games and recently firing most of his engineering staff, Bill was looking for a new game to keep the momentum going. He got the new game in Bushnell and Dabney's proposal plus a new engineer out of the deal as well as Bushnell left Ampex to join Nutting (followed by Ted close to a year later). Bushnell and Ted's deal was for Nutting to license the game for manufacturing, but they'd do all development on their own time (working after hours at Nutting and at Ted's house).

By August of 1971 they were testing their prototype at a local college bar called the Dutch Goose to great results. The following month, as Bill Pitts was installing his *Galaxy Game* (which uses an actual full DEC minicomputer running *Spacewar!* code) at the Stanford Student Union they found the results at their subsequent test locations far less promising. It turned out the students at Dutch Goose were mainly students pursuing degrees in engineering, physics, and computers. Stepping out of that comfort zone of technical professionalism meant that the patrons at other locations ▶

» Early arcade games did not use microprocessors or software. Rather they used logic chips, such as this one below.

» The exterior of a prototype *Pong* cabinet from the Seventies. This angular design was fairly common.

» Usually a stripped down television, single game board, and a power supply were all that resided inside machines.

KEY EVENTS

1971

■ *Computer Space*, the world's first video arcade game is tested in August at the Dutch Goose in Menlo Park, California.

1972

■ Atari Inc. is formed in July of this year and work begins on what becomes their first video arcade game, *Pong*. By mid August it's being play tested at Andy Capp's Tavern.

1975

■ Atari/Kee released Indy 800, the first multi-layer video arcade game in April. A massive game supporting 8 players at once. They also release the first driving video game in a full cockpit style cabinet, *Hi-Way*.

1975

■ Midway releases *Gun Fight*, the first microprocessor driven video arcade game ever.

1976

■ Exidy releases *Death Race*. Loosely based on a film of the same name, the driving over of figures that look like people creates the first controversy in videogames.

DEVELOPER TOP PICK

DAVID PERRY

"*Moon Cresta*. In it you can stack up your firepower, so you go from weak to strong to weak. I used this idea in games for many years. You'll see it in games like *Earthworm Jim* (weak worm in a strong suit), *Messiah* (weak baby possessing a giant's body) etc. I personally like that gameplay style where you're kicking butt one minute, then very defensive the next."

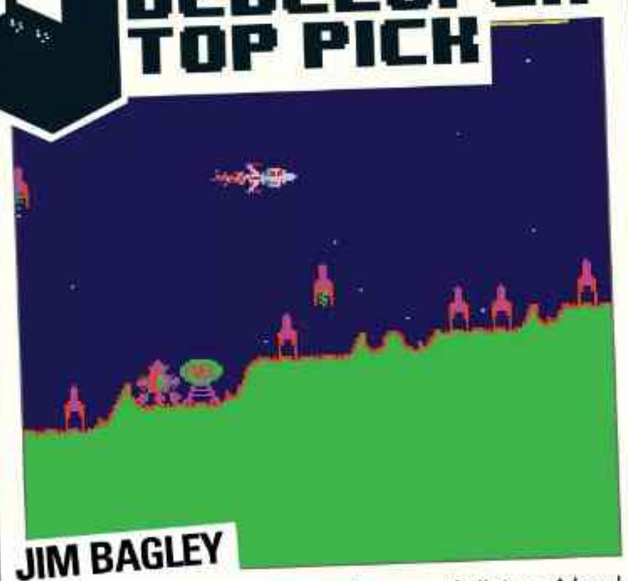
were entirely confused by the gameplay, controls and overall presentation. In fact this was when the duo learned that presentation across the board was just as important to its success, something the big boys of the coin industry already knew. Bushnell countered with a slick new futuristic design and a somewhat clearer control scheme. A package that actually caught the attention of everyone when they showed it off in Nutting's booth at the main trade show of the era, the Music Operators of America in Chicago. The automated music industry – jukeboxes – was actually the dominant force in coin-operated entertainment at the time, with arcade games being a subset. By the mid Seventies the show would change it's name to the Amusement and Music Operators of America thanks in no small part to the rising dominance of the coin amusement industry thanks to arcade videogames.

Don't expect the type of astonished hoopla that the Apple II generated during its debut at the West Coast Computer Faire six years later though. The common questions Bushnell and Dabney got were "Isn't this just a novelty?" or "Isn't it expensive to broadcast?" (yes, some thought that because there was a television inside that the picture of the game was being broadcast). Regardless, contrary to some modern retellings of the story, their game (named *Computer Space* by Bill Nutting) went on to sell what is considered a decent average run for an arcade game at the time – enough that the medium was considered viable.

Bushnell and Dabney famously left Nutting the following year to formally start their engineering firm Syzygy Company, only to have it grow into the future industry juggernaut Atari Inc thanks to a game developed by their first engineer, Al Alcorn. *Pong* started off as a starter exercise for Alcorn only to turn into a lesson for the entire coin amusement industry. With simple gameplay and controls, the cabinet developed by Dabney also featured a philosophy he and Nolan had learned during their *Computer Space* days. "Nolan was careful to have *Pong* look very understated so as not to offend women or families. We wanted to stay away from the girly (side art) that were on many pinball machines," states Alcorn. *Pong* is what drove the industry to take notice of the new medium, and a quick expansion as new companies sprung up everywhere with their own versions of the game. Once the big boys jumped on board as well and demand at established coin distributors grew across the globe, arcade space gradually became a fight of old technology and new as owners stocked both and the major companies continued to produce both. In fact for much of the Seventies pinball machines and video arcade machines were neck and neck in popularity and earnings.

A race that was understandable, as video arcade games were still in such a primordial state. Every new game was some new feat, especially since they were still being created purely through engineering. Colour came early on, thanks to Atari's Cyan research lab in Grass Valley that developed an alternate full color version of *Gotcha* that Atari released in October 1973. Animated characters were introduced by Ramtek's *Baseball* in 1974 as the industry moved to make more detailed and interesting games beyond simple ball and paddle driven games. 1975 saw the intro of giant

DEVELOPER TOP PICK



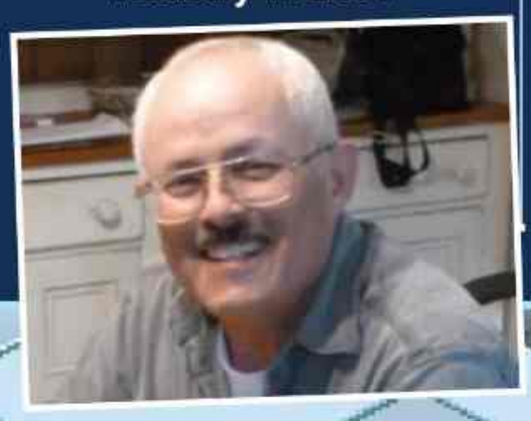
JIM BAGLEY

"*Scramble* is my favourite arcade game of all time. A local Spar shop got a sit-down cocktail cabinet of it and ran a competition of who could be the first to complete all the levels. I have many great memories playing *Scramble*, even to this day, and now my girls enjoy playing it too!."

> **"It wasn't a videogame because the planes appeared to be on a rotating piece of screen"**
> Ed Logg

ARCADE INITIATION

Though largely unknown to many, Jeff Bell is uniquely experienced to comment on the video arcade game industry. Starting in February 1973 at Atari Inc, he remained in the industry until 2003 when Midway Games shut down what was left of Atari's coin operations after exiting the coin industry in 2001



When did you first experience videogames and how did you get involved with Atari and video arcade games so early on?

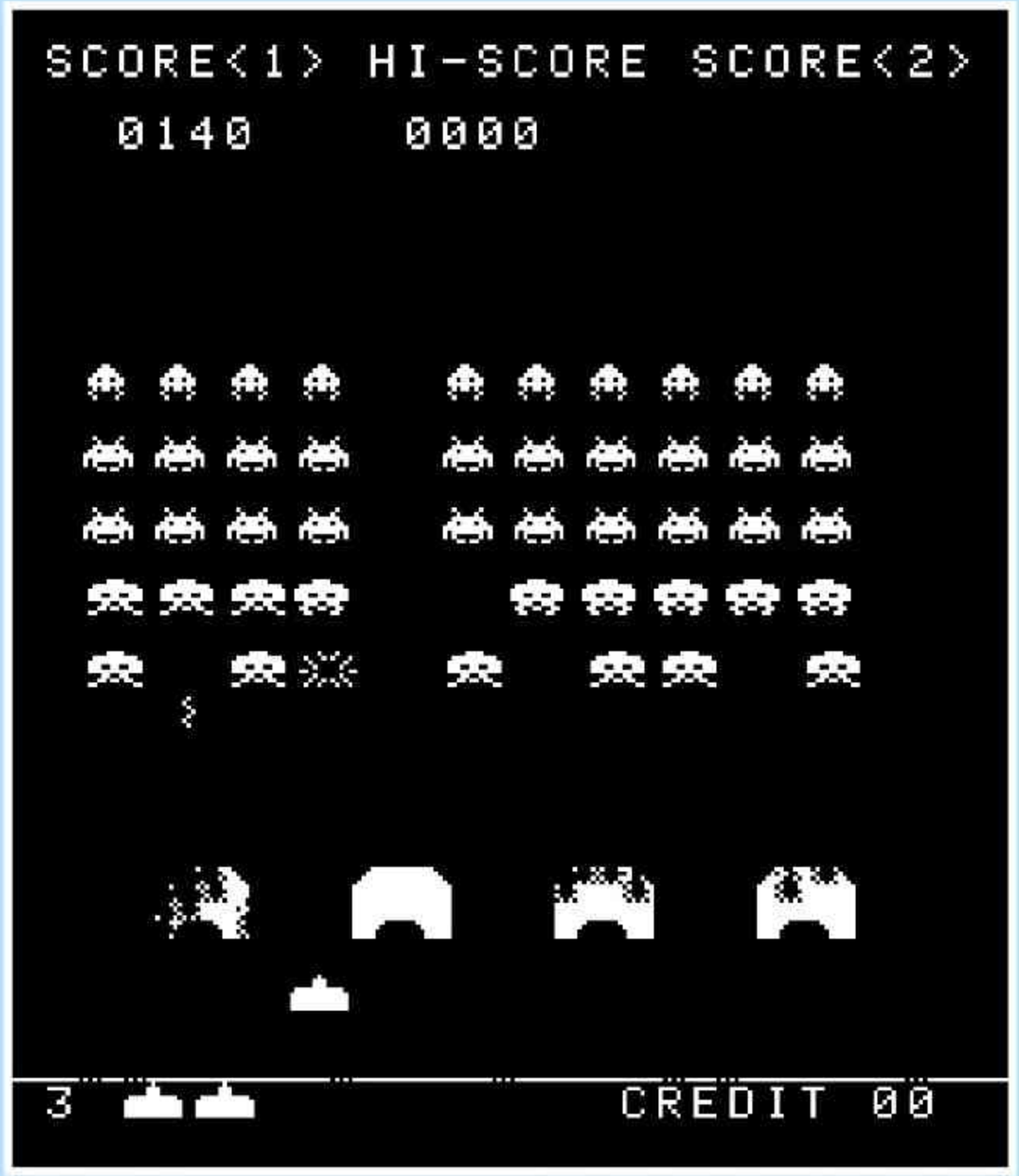
In late 1972 I had just applied for a job at Toys 'R Us and was just about to go into the hospital for health issues when my friend Keith Lafever came over to my house and excitedly said 'You've gotta see this! You've gotta come!'. So I jumped on the back of his motorcycle and ran up to Sunnyvale Bowl where there was a *Computer Space*. I put the only five dollars I had to my name in that machine, it was my first coin-op videogame, and I said "I want to do this (create games)." It was the coolest thing I had ever seen. When I got out of the hospital in November one of my friends, Derek Becker, was working at this place called Syzygy collecting coins out of pinball and videogame machines for them. He told me all about Syzygy and their game *Pong* that was coming up. When I got out of the hospital it turned out all my friends were working there at Syzygy. I went in and met Nolan Bushnell, who gave me a job, but I couldn't start until February when my doctor cleared me. Because I couldn't lift anything I became the third *Pong* inspector.

What jumps out about video arcade games in the Seventies era for you compared to the later decades?

In 1972-74, we had to explain to people what a videogame was. By 1976 that had changed to explaining what a 'coin-op' video game was. By the Eighties we needed to explain what the 'Real Atari' was.

Can you elaborate on the last two statements?

Sure. By the mid Seventies, the first impression many people had of videogames came from home game consoles. Whenever somebody discovered that I worked at Atari, they would say something like 'Oh yes! I have one…', and I would feel the need to explain that I worked in 'Coin-Op', that a quarter was required to play. By the Eighties, perhaps as an outgrowth of the Consumer Division's success, we began to refer to ourselves in conversations and on T-shirts as 'Coin-Op – The REAL Atari'. This wasn't well received by the other divisions. I heard that we had been asked to not use the phrase. Today I still respond as I did in the Eighties, 'I worked at Coin-Op, the REAL Atari'.



multiplayer games like *Indy 800* and the continuation of the expansion of gaming ideas, including a variety of driving and war games. However, it was one technological advancement in video arcade games that made the biggest splash that year: the addition of microprocessors.

All the major arcade companies had already begun exploring adding microprocessors to pinball machines during 1974, and by early 1975 that had extended into video arcade games; Lead by Cyan at Atari and Dave Nutting Associates (yes, that Dave Nutting) that was now affiliated with Bally/Midway. Dave Nutting's project – transferring the Taito-licensed *Western Gun* into a microprocessor driven game – was first in November 1975. That was (almost ironically) followed by Atari/Kee's *Quiz Show* quiz game in April 1976 at the same time they were debuting one of the last of their big non-microprocessor games, *Breakout*.

Even with all this advancement of videogames in the coin industry, video arcade games were still just more of a curiosity in the public consciousness. It really wasn't until this mid-Seventies period and the arrival of the inexpensive TV-tennis home game systems like Atari's Home Pong and Magnavox's Odyssey 100 and 200 that public awareness really began to take off. Certainly video arcade games had been making appearances in film and television since the early Seventies (the first well-known one being *Computer Space*'s appearance in 1973's *Soylent Green*). But now with the buzz generated by home games, the appearances in those entertainment mediums became more frequent.

The real growth of video arcade games though, both as the dominant force in the coin industry and as a popular form of entertainment in general, started in the latter part of the Seventies. A result of what was really a perfect storm of reasons, driven by the uniquely timed appearance of a very popular movie combined with a cornucopia of microprocessor driven devices along with some very popular video arcade games being released. From a pop culture perspective, the late Seventies was an explosion of high-tech interest by the public, arguably fuelled by the 1977 release of the film *Star Wars*. Demand for electronic driven consumer devices, gadgets and entertainment seemed to skyrocket and in the arcades videogames were poised to fulfill a kid's demand to live their own space battle-driven fantasy.

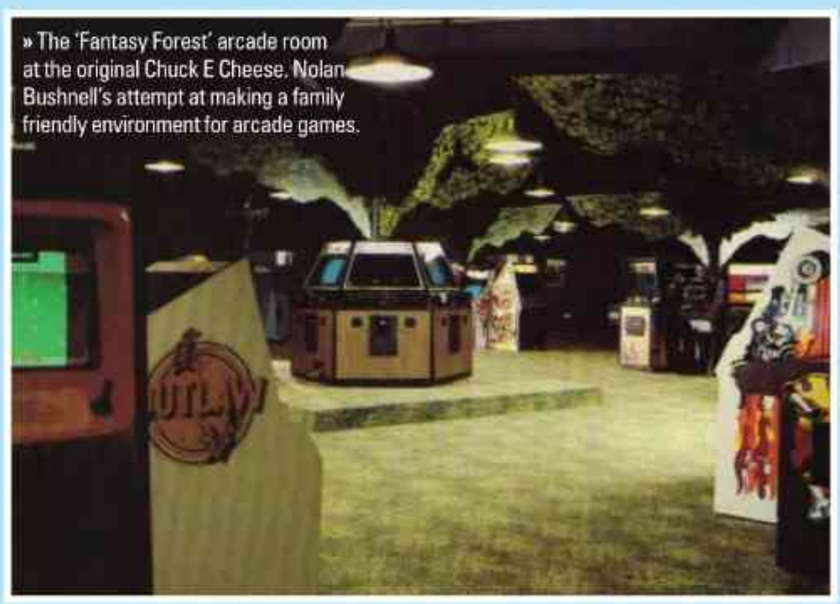
» Electromechanical games predated video games in the arcade, informing the cabinet design of the latter.

» *Tank*'s military combat theme would be replicated often in years to come.

The game which lead the charge to feed that hunger, and became a phenomenon of its own during the process, was *Space Invaders*. Created by the same person behind Taito's *Western Gun*, Tomohiro Nishikado, in 1978 it took Japan by storm and soon after the rest of the world. Games like Exidy's *Star Fire* brought the literal *Star Wars* experience to the arcade, but it was the further extreme popularity of 1979 space shooter games like Namco/Midway's *Galaxian* and Atari's *Asteroids* and their ever-increasing game technology that gave a taste of what was in store for the Eighties while providing a thirst for more.

It took eight years for the beginning of the dominance of videogames in the coin industry to come about, however 1979 was really when the demand for the engaging medium skyrocketed. Many non-traditional locations (family restaurants, doctors offices, gas stations, etc) suddenly started operating the computer-driven machines there, and for a kid it seemed everywhere you'd go there was an opportunity for you to ask your parents for a quarter (or a ten pence piece in the UK) to play a game. It would also set up a time when dominant hits were first released as coin-op machines and later ported to home versions, something that would last until the mid Eighties.

» The 'Fantasy Forest' arcade room at the original Chuck E Cheese. Nolan Bushnell's attempt at making a family friendly environment for arcade games.



DEVELOPER TOP PICK

BOB POLARO

"Without question *Missile Command* – best feel of any game when putting out the spreads."

THE 80S

THE GOLDEN AGE OF THE ARCADE

The Eighties produced a multitude of iconic coin-ops. Mike Bevan gains insight from classic developers into the most thrilling of decades to be an arcade gamer

IF THE SEVENTIES HAD BEEN A TIME OF EXPERIMENTAL INVENTION FOR THE ELECTRONIC AMUSEMENT INDUSTRY, THE EIGHTIES WAS THE DECADE IN WHICH IT BLOSSOMED WITH INNOVATION, USHERING IN THE SO-CALLED GOLDEN AGE OF ARCADE GAMES. "It was the time when fully formed videogames first appeared," says celebrated arcade designer Eugene Jarvis. "Going from almost a blank screen to incredibly crafted games unleashed a mania of hundreds of millions of crazed players worldwide that couldn't get enough of these new fangled videos. Since so few videogames had come before, entire new genres were created; sports, character, maze, shooters, fighting, driving games… The excitement of seeing the birth of such a cornucopia of original titles was thrilling to players."

New games were appearing so fast in amusement parlours in the period from 1980 to 1983 that it was hard to keep track of all the goodies – *Battlezone*, *Missile Command*, *Pac-Man*, *Defender*, *Frogger*, *Tempest* and *Donkey Kong* to name just a handful. It was the decade that saw the appearance of the first LaserDisc game, *Dragon's Lair*, spectacular coin-op cabinets like *Spy Hunter*, *Star Wars*, *OutRun* and *Space Harrier*, the first arcade game with 3D polygon graphics, *I, Robot*, and the rise of companies like Capcom and SNK. Behind the burgeoning cabinet rosters of the arcade operators lay an East versus West power struggle between North American and Japanese manufacturers, with the likes of *Space Invaders* publisher Taito, Nintendo, Konami, Namco and Sega competing for floor space with Atari, Williams Electronics, Stern, Bally/Midway and Exidy.

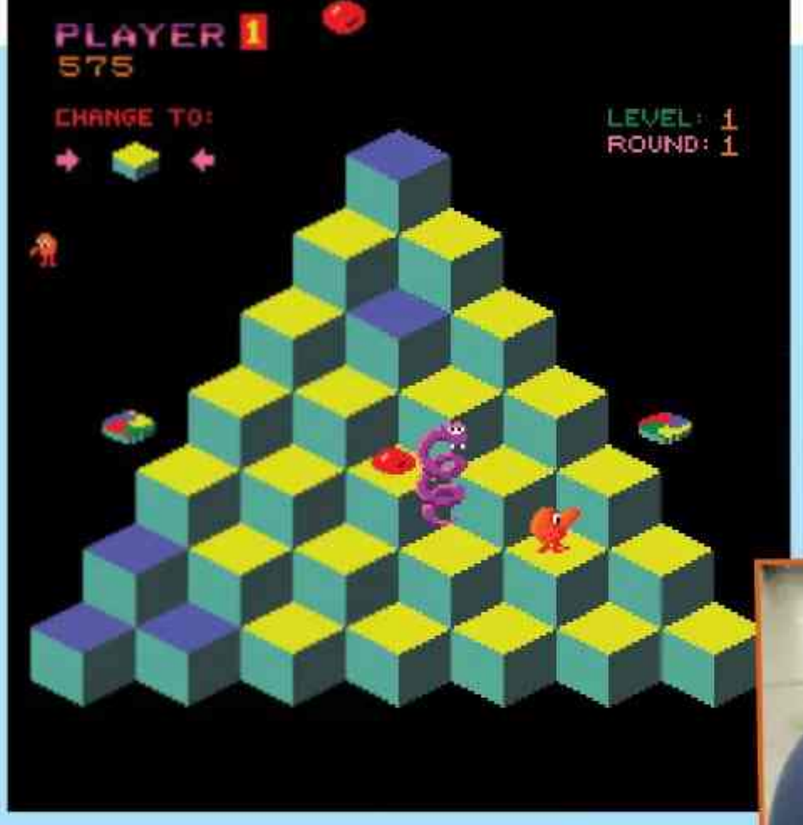
"It was a gold rush," says Exidy programmer Ken Nicholson. "Anything with a screen at a pizza parlour would gobble up quarters. Another factor was the availability and growth of microprocessors. Before the 8080 and 6502, game development was based on much simpler logic. In the early Eighties coin-op games from Japan started to grab the market. At first they were unappealing to US game players for aesthetic reasons but then games from Japan began to dominate the arcade, and they had a price advantage…"

"The Japanese developers played a huge role in creating many mega-titles of the era," admits Eugene. "Although videogames originated in the US, as soon as they were popularised, many of the big innovations came from Japan. Different styles of play evolved in the East and West. They were very dominant in character, maze, shooting and driving genres, and were highly influential in the birth of fighting games. Many Japanese developers, strongly influenced by anime culture, emphasised character development, hand-drawn animation and backgrounds, and a more deterministic, scripted, pattern-type play as in *Space Invaders*, *Galaxian* and *Pac-Man*."

"American designs reflected a programmer-centric design culture, emphasising algorithmic generation of backgrounds and enemy dispatch. There was an emphasis on random-event generation, particle-effect explosions and

» *Galaga* (1981), the sequel to Namco's *Galaxian*, gave players the chance to double their firepower with the help of the alien mothership.

» The stunning *Tempest* (1981) was Atari's first full-colour vector arcade game.



physics in titles such as *Asteroids*, *Space Wars* and *Defender*. The increased emphasis on algorithmic AI, physics and randomness favoured a more improvisational and tactical playing style, due to the lack of scripted events. It was a big challenge to be innovative in the face of such revolutionary competition. All Western developers were strongly inspired by the master designs coming from Japan. For example, American games such as *Centipede*, *Q*Bert* and *Robotron 2084* were strongly influenced by Japanese character animation styles."

While the Japanese had the edge with character-based titles like *Pac-Man*, *Dig Dug* and *Mr Do!* American designers led the way with engaging and novel action games and shoot-'em-ups such as *Joust*, *Tempest* and *Defender*. "Character and shooter games were the two genres that defined the era," states Eugene. "On the character side, *Pac-Man*, *Donkey Kong*, *Q*bert*, *Frogger* and *Mario Bros* set the pace; and in the shooters the defining titles were *Missile Command*, *Defender*, *Berzerk*, *Robotron*, *Galaga*, *Centipede*, *Tempest* and *Zaxxon*, among others."

Williams Electronics was, alongside Atari, arguably the most pioneering of the early Eighties US coin-op publishers. It was one of a number of American companies, including Bally, Stern and Gottlieb, which made the transition from producing mechanical amusements and pinball games to video arcade games. Eugene had started ▶

» Gottlieb's *Q*bert* (1982) was one of the most successful US-developed character-based arcade games.

CLONE WARS

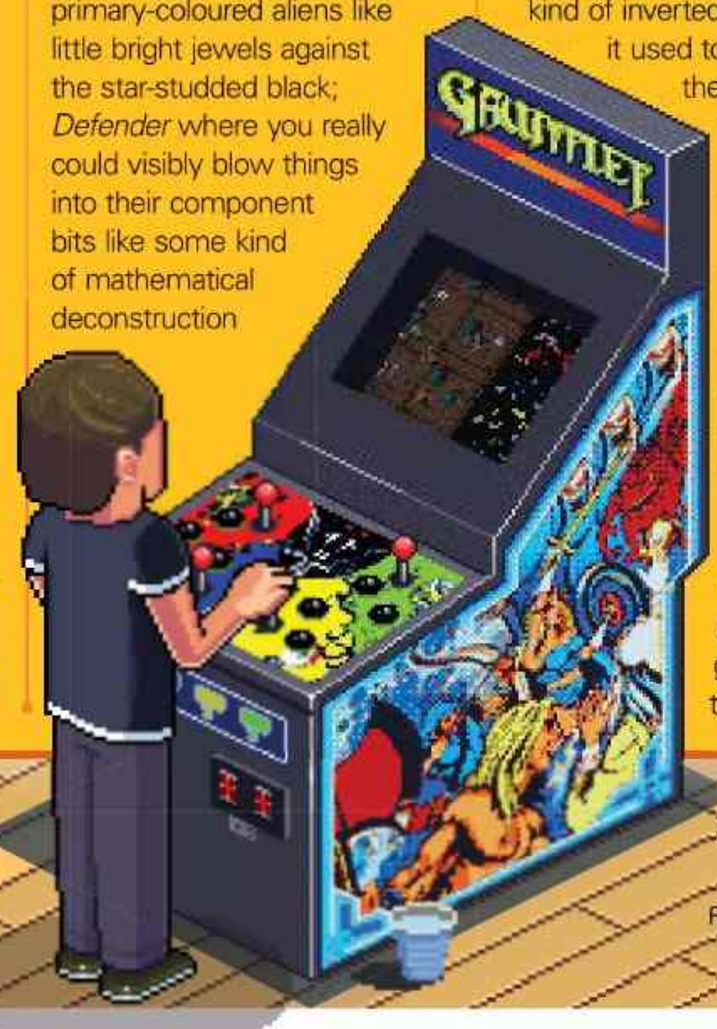
Jeff Minter discusses Eighties arcade tributes

What's your earliest memory of an arcade?
I'm so ancient my memories of arcades actually go back to before the dawn of time when there were no videogames. When I was five years old our family started what was to be a succession of annual Welsh holidays near Snowdonia. Central to these outings were frequent visits to The Golden Sands on the seafront at Tywyn, a combined chip shop and arcade. No videogames, but I remember playing on the grabber machines, penny slot machines, pushers, mechanical horse racing thingies and those driving games that had a rolling film with the track on it and your car was on a stick. The first arcades I used to hang out in with any kind of regularity were the old Piccadilly Arcade up in London, and the Crystal Rooms off Leicester Square. The old Piccadilly Arcade no longer exists as it was underneath where the Trocadero is these days. I can still remember exactly where the *Star Fire* machine was (that I put some tasty high scores on).

Why do you think so many developers started off making clones?
Cloning an arcade game was a good way to learn the basic necessary skills of game design and programming. Arcade games are existing designs that you know work, so programming them when you're learning teaches you a lot. You learn the basic skills of moving stuff around, reading joystick inputs, making noises and implementing game logic using an established template and you know when it's working right. When it's working but doesn't feel like it should then you learn about tuning stuff as you adjust things to make it correct. You learn about hardware limitations and you start maybe learning ways to program around them if you're trying to clone an arcade game that came from hardware more powerful than you are using. And at the end of the day if you weren't too cheeky about it after all that good learning you ended up with a product you could sell.

You've cloned many popular shoot-'em-ups. What do you love about the genre?
I've just always loved shooters, I enjoy the headspace they put you into, the so-called 'zone' state that is always the place I aim to take you to in my games. I particularly enjoyed the look of some of the earlier shooters, again the phrase "abstract beauty" springs to mind. In most games the graphical limitations of old systems just make the games look like shit when viewed through modern eyes, but when you look at stuff like the pure glowing vectors of *Asteroids* and *Tempest*; *Galaxian* with its insectoid primary-coloured aliens like little bright jewels against the star-studded black; *Defender* where you really could visibly blow things into their component bits like some kind of mathematical deconstruction firework display; the absolutely perfect balance of beauty and brutality that is *Robotron*... Those things are still beautiful now, but back then, when only a few years previously the whole idea of 'game' involved cards or boards or sports you were rubbish at because you didn't have 3D vision, the opportunity to step into and dance within these exquisite glowing other-dimensional worlds was something extraordinary and wonderful. It's that feeling that I want to try to convey to people today, with the kind of stuff I make.

Your own games improve on the arcade originals, why do you do this?
I think it's just a natural progression; when I started the first things I did were stuff like *Centipede* and *Space Invaders* on the ZX81 and *Defenda* on the VIC-20, and then Atari started getting less tolerant of people doing clones and I wanted to do a *Centipede*-style game on the VIC anyway, so I perforce had to make it not so obviously *Centipede*-ish, and ended up making something that I actually liked more than vanilla *Centipede*. Learning that it's okay to colour outside the lines is an important part of anything really. Scrolling shooter suddenly didn't *have* to mean *Defender* or *Scramble* – why not camels or sheep? These days of course it's kind of inverted from what it used to be back then, where the arcade games were way more powerful than the hardware you were trying to port them to. Doing a simple remake is pretty easy, but a modern update of a game is tricky to do well.



DEVELOPER TOP PICK

TRIP HAWKINS

"*Gauntlet* is my favorite arcade game; in fact I bought my parents an upright *Gauntlet* that they had in their basement for many years. I can still hear the game – 'Welcome, Elf!'"

» Bally/Midway gave players the chance to live out their 007 fantasies in *Spy Hunter* (1983).

▶ out programming sound and gameplay features in pinball games for Atari and Williams, and this early industry experience was to become a huge influence in the creation of his arcade titles, *Defender* and *Robotron 2084*.

"Pinball was a great training ground," he tells us. "Audio was especially important in pins because there is so much dead time where the ball is rolling around the playfield, not hitting any targets. Background sounds were used to generate increased tension and excitement as a game approached a climactic event. My pinball sound work lead to the creation of many of the amazing synthesised sounds for *Defender*, *Robotron* and other games in the classic era at Williams." The format of the traditional pinball table was also a source of inspiration for other game manufacturers. "Games such as *Breakout* and *Space Invaders* adopted the basic human versus machine pinball game style – three balls (or lives) per game, and the ability to win an extra ball (life) with a high scoring achievement," Eugene explains. "So it was a natural transition to move from pinball to video."

Defender's dazzling, pyrotechnic visuals and blistering sound effect took arcades by storm, and its free-flowing, multi-directional gameplay represented a huge step up from Konami's *Scramble*, released a year earlier. The aural delights of Williams arcade games became a signature of Eighties arcades, along with *Pac-Man*'s distinctive wakka-wakka, *Berzerk*'s robotic speech and the jingles and digitised movie quotes from Atari's *Star Wars* cabinet. Williams also had one of the first two-player cooperative arcade titles with surreal physics-based flap-'em-up *Joust*. "This was one of the first ideas I had on the game," says designer John Newcomer. "If it could be designed for two players to compete or cooperate simultaneously, it meant two coins would go in the machine at the same time.

"Coin-op games at the time were all single-player, except *Wizard Of Wor* and *Space Wars*, which was a dead game by this point. My hope was that *Joust* would be a step towards making two-player take off in subsequent games. Unfortunately, people did not go for the two-player feature. It helped the cash box a bit, but the vast majority of plays were still single-player." But while *Joust* was the exception to the norm in 1982, it paved the way for later Eighties multiplayer coin-ops like *Gauntlet*, *Bubble Bobble*, *Salamander* and *Double Dragon*.

© Olly Cotton

» *Dig Dug* (1982), a tunnelling action game from *Pac-Man* manufacturer Namco.

KEY EVENTS

1980
■ Namco launches *Pac-Man*, the first arcade game to eclipse *Space Invaders* in terms of units sold. Atari's *Battlezone* and Williams' *Defender* are released.

1981
■ *Donkey Kong* reaches Western shores, introducing us to the now-familiar King Kong-inspired ape and Nintendo's perennial mascot, Super Mario.

1983
■ *Star Wars*, *Q*bert* and *Spy Hunter* hit arcades, while Cinematronics unleashes *Dragon's Lair*, the first LaserDisc game. Capcom is established.

1986
■ Sega releases *OutRun*, one of the most successful driving games of the decade. Taito releases its popular game *Bubble Bobble*.

1989
■ Atari's *STUN Runner* and *Hard Drivin'* take racing games into full 3D. *Final Fight* and *Golden Axe* represent the peak of popularity for scrolling fighters.

DEVELOPER TOP PICK

DAVID BRABEN

"My favourite arcade game was the excellent Williams *Defender*, written by Eugene Jarvis in 6502 machine code. I loved the challenge of the game, and for me was the first game I saw in the arcades that wasn't a *Space Invaders* derivative, and was in colour (ie not stick-on strips on the TV screen like *Space Invaders*)."

» *I, Robot* (1983), the first polygon arcade title, from *Missile Command* and *Tempest* designer Dave Theurer.

© Luna City

» Bally/Midway's beautifully neon-lit cabinet for *Tron* (1982) was a work of art.

» The *Double Dragon* games, along with *Final Fight* and *Golden Axe*, were defining scrolling beat-'em-ups.

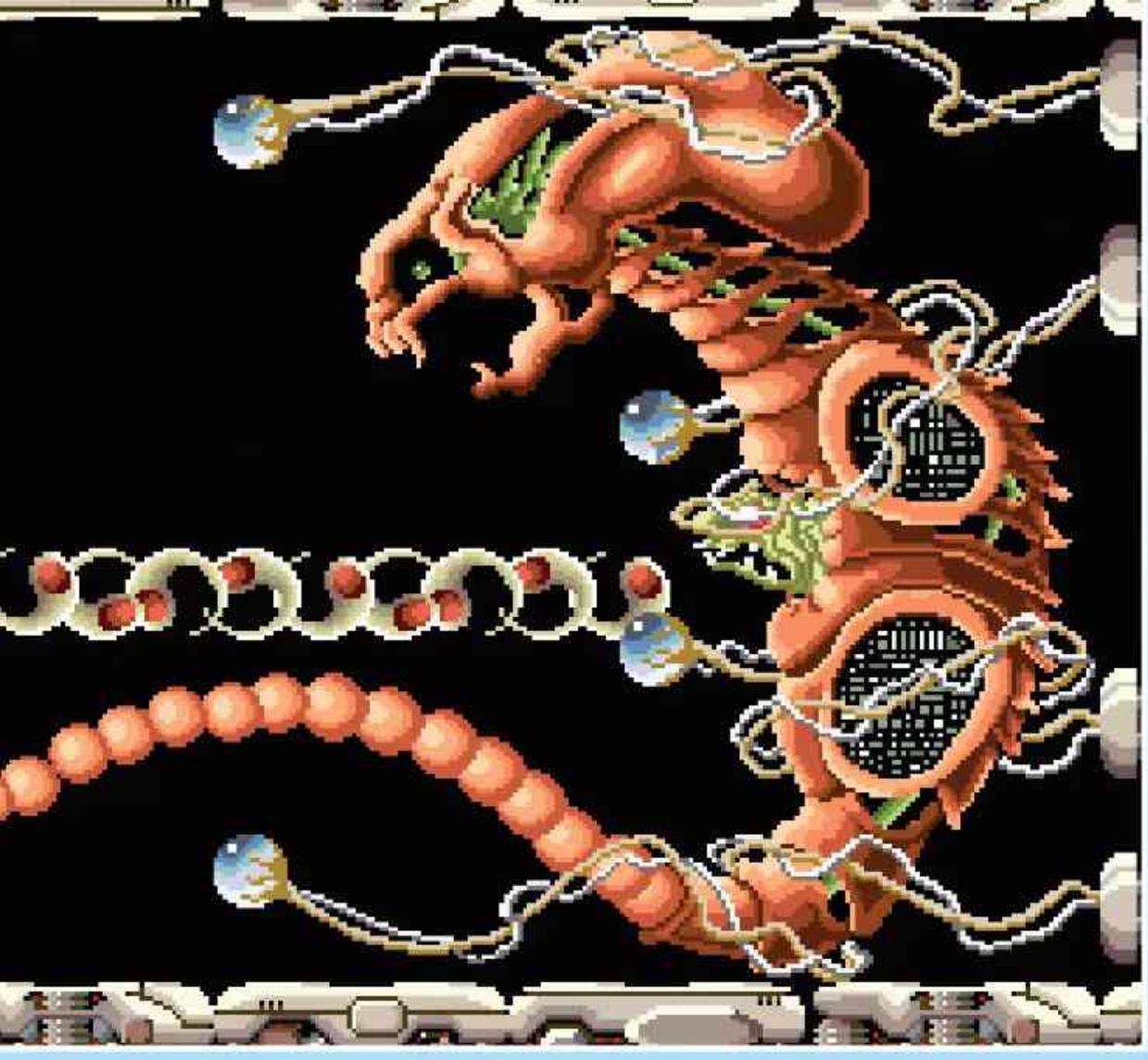
» *R-Type* (1987) is one of several classic Eighties scrolling shooters including *Gradius*, *Salamander* and the three-screen monstrosity Darius.

Designer of *Q*bert* Warren Davis remembers, "I probably played games in bars more than in arcades, and you would know what games the bar had. So when you went back and they had a new game, it was a big deal. You'd check it out, maybe watch other people play and then decide if you wanted to risk one of your own quarters on it.

"Williams seemed to have the most intense game experiences. I wasn't particularly a fan, but I admired the skill a person had to have to master their games. My favorite Williams game was probably *Joust*. Who knew I would later get to program *Joust 2*? I liked *Dig Dug* and the *Star Wars* vector game from Atari, *Berzerk* from Stern, *Pac-Man* and *Tron* from Bally/Midway. I always thought Williams pushed the envelope

"I always thought Williams pushed the envelope in terms of graphics with Joust and Sinistar"

Warren Davis



in terms of graphics with games like *Joust* and *Sinistar*, while Nintendo had the best use of cartoony characters in their games."

"Personally, I enjoyed games from most of our competitors," admits Ed Rotberg, creator of Atari's *Battlezone*, the first coin-op title to allow players full freedom of movement in a 3D landscape. "Certainly Williams was at the top of the list with Eugene's games like *Stargate*, *Defender* and *Robotron*. Tim Skelly, whether at Cinematronics or Gottlieb (*Rip Off*, *Star Castle*, *Reactor*) was constantly earning my respect. Of course, the Japanese manufacturers had some great products as well. *Pac-Man* and *Galaga* took up a lot of my time and money."

Atari continued to break new ground through the Eighties, improving its vector graphic hardware to include colour for titles like *Star Wars*, *Tempest* and *Black Widow*, and becoming one of the first companies to produce true 3D arcade games, starting with 1984's enigmatic *I, Robot*. "Certainly the Vector Generator (followed by the colour VG) allowed for such games as *Asteroids*, *Battlezone* and *Tempest*," says Ed. "There is a case to be made that the Vector Generator hardware allowed for decent 3D for the first time. I also think that, at the other end of the Eighties, the polygon hardware that was first used in *Hard Drivin'* and *STUN Runner* also helped keep Atari as a player in the arcade game business."

"The mix of people was key to the way it all developed," says ex-Atari designer Peter Lipson, producer of the *Indiana Jones And The Temple of Doom* coin-op. "So many people had excellent design skills, and the way we were mixed at work led to a lot of innovation but even more importantly, to a lot of refinement of ideas. Your co-workers had no trouble telling you when something sucked. But when you saw them flocking to your game in the lab during their break times, you knew you had something.

"Another thing people have forgotten is that arcades used to be somewhere you could go with your date just to see what new game might have shown up. I think the era of the fighting games made the arcades far less female-friendly. Not that women haven't always been players, but the casual audience seemed to be put off by the change in aura. After that it seemed games couldn't succeed just by being quirky and fresh. We were entering the equivalent of Hollywood's blockbuster era."

» The atmospheric *Ghosts 'N' Goblins* (1985) hinted at the high-quality Capcom arcade output to come.

DEVELOPER TOP PICK

JOHN ROMERO

"Absolutely, for me, *Pac-Man* changed everything. Most arcade games before *Pac-Man* were all black-and-white alien-killing games. *Pac-Man* emerged with a completely unique premise: run away from cute monsters while eating dots. No violence, no guns, and a window into the possibility space of game design."

MARIO MAN

Alex Crowley talks to **Retro Gamer** about his Nintendo collection

What made you consider amassing such a vast collection of Nintendo arcade machines?
Preservation – it is essential to hold on to this social history of arcade machines because it is quickly being forgotten about. Also, because arcade machines are so big most collectors only choose the best games for their collection. But I took it on my self to concentrate on Nintendo and that meant taking on and restoring some of the less well-known titles, which I am really proud off as its turns out to be quite a unique and rare collection.

How did you go about it initially?
My first arcade machine was *Space Invaders Part II*, and that was bought on eBay. From there I joined the arcade forums UKVAC & Jamma+ – it has opened the doors to a community of fellow collectors where I have imported machines from the US and found rarities amongst UK collectors and made some very good friends.

In your opinion, what are the highlights of your collection?
The highlights in my collection are *Donkey Kong 3* and *Space Launcher*. *Donkey Kong 3* was a kit that I managed to find in its original box complete for just $160. I then converted a versus upright cab which I bought from *Missile Command* champion Tony Temple and turned it into the underrated game I love to play today. It turned out to be my favourite game in my collection. *Space Launcher*, apart from being a great game, is a highlight because its the only known example to exist in the world amongst the community.

What do you think that the arcade market lost following Nintendo's departure to home consoles?
Well to be honest until *Donkey Kong* came along they were copying a lot of other more successful arcade developers. But I think once *Donkey Kong* dominated the world it changed Nintendo forever. By 1984 arcades were dying out anyway, so it was natural for Nintendo and other manufacturers to pursue the home market. Arcades were never the same after the Eighties kids grew up, but the arcade games didn't.

***Mario Kart Arcade GP DX* was released recently in arcades. What are your thoughts on other companies taking Nintendo's property to market?**
I think it's a great idea, and anyway, Sega made games and distributed them for Nintendo back in the late Seventies. I think Nintendo has to let go of some of its top titles to third parties to help out with their huge and fantastic back catalogue of games.

How do you think arcades have changed since the early days?
They have changed in the sense that kids no longer go there to see the latest games and ultimate new graphics. The technology was new and exciting when we were kids, the machines always had new experiences and innovative ways to play a new game. With synthesized speech, trackballs and extra buttons these were magical light boxes and it was an amazing time to be a kid.

THE 90S

THE DECADE OF RIVALRIES

Nick Thorpe revisits the arcade's final decade of dominance, when players took to fighting and manufacturers battled over technology

WHILE THE NINETIES WOULD PROVE TO BE A TIME OF GREAT CHANGE IN THE ARCADE INDUSTRY, YOU WOULDN'T KNOW IT TO LOOK AT THE EARLY YEARS OF THE DECADE. Scrolling beat-'em-ups, popularised in the Eighties, continued to prove popular with audiences. Konami delivered a string of licensed hits, from *The Simpsons* to *X-Men*. Taito was still introducing new *Space Invaders* games to market, with *Super Space Invaders '91* making its debut. At Williams Electronics, a young Mark Turmell was working to revive an Eighties hit. "I joined Williams Electronics with the sole purpose of reviving the dual-stick control, and told them so during my interview process," remembers Mark, who was as thrilled by the power of arcade hardware as the players. "I had been doing Atari VCS cartridge-based games, where you only had a few sprites that could be on the screen, so this was an amazing advance for me. In the first few days I kept turning on more and more objects on the screen drifting toward the player, and was mesmerized by the power." *Smash TV* was a game that typified the arcade experience, with fast action, amazing amounts of carnage and huge bosses. However, it wasn't the success that its developers had hoped for. "*Smash TV* won some arcade awards, and had decent success at that level, but it was still a disappointment to me in terms of sales and cash box collections," confides Mark. While Mark would eventually go on to huge success with *NBA Jam* a few years later, *Smash TV*'s situation was one that was mirrored across the industry – a quick look at the arcade releases of 1990 will show you a lot of good games, but solid releases rather than enormous hits. Even the likes of Sega's *G-Loc*, housed in the awesome fully rotating R360 cabinet, were old experiences dressed up with new hardware.

But the first signs that the winds of change were blowing came with the first enormous hit of the decade. The original *Street Fighter* had done reasonable business for Capcom in the Eighties, but the arrival of its sequel in 1991 quickly relegated it to a mere footnote in the history books. *Street Fighter II*'s colourful cast of international martial artists and sublime gameplay quickly endeared it to millions of gamers worldwide. The game would prove responsible for the rise of the one-on-one fighting genre, and is often credited with renewing interest in arcade games during the early part of the decade. Previous arcade games had often focused on co-operative play or indirect competition for high scores, but *Street*

» *Daytona USA* was Sega's shot back at Namco's *Ridge Racer*, early games in the hardware arms race between the two companies.

» No matter what game you were playing in the Nineties, there was a good chance that you'd see this screen appear...

"WINNERS DON'T USE DRUGS"

William S. Sessions, Director, FBI

DEVELOPER TOP PICK

ANDREW BRAYBROOK

"We were lucky to be growing up just as arcade games started appearing, so they had a big influence on us. Today my favourite might be *Space Harrier* as it was the first game I played with a moving platform. The music was dynamic and I loved the dragon-riding bonus sections."

FIGHT CLUB

Mark Starkey, owner of London's The Heart Of Gaming arcade, talks to us about the competitive fighting game scene

When did it feel like developers started to take notice of the fighting game community's needs in creating games?

1994 saw the culmination of the *Street Fighter II* franchise in *Super Street Fighter II Turbo* and also the release of SNK's *King Of Fighters* series. After the overwhelming popularity of these games sunk in, tournaments were held in arcades and at some point around that time, programmers started adding 'event mode' in the operator menus to help in running them.

How did more advanced strategies spread in the days before YouTube and mass access to community websites?

The most obvious way was to go to the arcade. Watch, play, learn. Get beaten, get better. It was that simple. After all, every match was technically a 'money match', with pocket money or part time wages at stake in front of crowds.

Some people had links in the east, as the Asian community in London was huge, as was the high street market for grey imports. Some people were lucky enough to have multi system VHS players and imported tapes to help study. People with plenty of money invested in Superguns, homemade consoles capable of running arcade boards, or the Neo Geo AES. This allowed people to practice at home by dropping a huge lump sum rather than 50p coins.

With so much competition in the fighting game market of the Nineties, do you feel that any hidden gems were edged out of the scene?

Absolutely. Only recently a bunch of us were discussing how much of a shame it was that games such as *Ninja Masters* and *Breakers Revenge* lost out because they were overshadowed by games such as the *Last Blade* series. Even the *Street Fighter III* series lost out to the unstoppable popularity of the *King Of Fighters* series, and was only able to blossom after the turn of the millennium.

"I joined Williams with the purpose of reviving the dual-stick control"

Mark Turmell

Fighter II's key appeal was in standing next to your opponent as you bested them, a factor which paved the way for both the game and the wider genre to become popular in tournament play. Later in 1991 SNK released *Fatal Fury*, a one-on-one fighting game directed by Takashi Nishiyama, a former Capcom employee who had served as the director of the original *Street Fighter*. As the two companies became increasingly prolific in the genre, a rivalry developed which would last for the remainder of the decade.

As well as providing a business boost, the beat-'em-up sensation produced controversy. While the likes of *Street Fighter II* and *Fatal Fury* had been violent, they were never gory. *Mortal Kombat* quickly changed that. Though it wasn't the first game to feature sprites digitised from human actors – they were introduced in the early Eighties and popularised by *Pit Fighter* in 1990 – the combination of the graphical approach with a high level of violence and gore caused a major moral panic in the way that the cartoonish likes of *Time Killers* never could. *Mortal Kombat* would go on to be one of the key titles in the 1993 US Senate hearings on videogame violence, though largely due to its appearance on home consoles. However, the Amusement and Music Operator's Association was represented at the hearings and, along with the American Amusement Machine Association, created a parental advisory system the following year. This didn't stop the release of *Mortal Kombat II*, nor other gory fighters that appeared in 1994 such as *Bloodstorm* and *Killer Instinct*, but applied a colour-coded rating to the cabinet for all to see.

Around this time, the demise of an old technology became apparent. Laserdisc ▶

» The infamous Fatality death moves caused *Mortal Kombat* to rake in both quarters and column inches.

» *Street Fighter II*'s success is hard to overstate – individual machines were taking in £1,000 per week.

» Namco's *Starblade* provides a key example of how rapidly polygon technology developed – it's only two years older than *Ridge Racer*.

games, which had set new graphical standards when introduced in the Eighties, still seemed to be strong in the early Nineties. American Laser Games released *Mad Dog McCree* in 1990, and in 1991 Sega brought *Time Traveler* to market in an innovative cabinet which used a mirror to create the illusion of holographic projection. But by 1994, the final Laserdisc games had left the production lines, including Atari Games's *Cops* and American Laser Games's *Fast Draw Showdown*.

But while old technologies fell by the wayside, others rose to prominence. Polygonal 3D games began to hit their stride in the early Nineties – while they had existed since the Eighties, the arrival of Sega's *Virtua Racing* in 1992 would kick off a technological arms race. The game's high polygon count was achieved with the Model 1 arcade board, a joint development with General Electric Aerospace. The board would only host another five games, including *Star Wars Arcade* and the original *Virtua Fighter*, as Sega had its sights set on the next big advance – but crucially, so did Namco. The company introduced the System 22 board in 1993 with *Ridge Racer*, the first ever 3D racing game to employ texture mapping, which enabled a greatly enhanced sense of realism over the flat coloured polygons that had gone before. Sega shot back with *Daytona USA* on Model 2 just months later. But while 3D games were becoming increasingly popular, they were very expensive for developers as well as operators, ensuring that 3D games didn't become the dominant force in the industry for some time. Indeed, huge film properties like *Jurassic Park* were still being given sprite-based treatments. But by 1996 both Sega and Namco had transitioned to releasing 3D games, having learned to exploit their boards to the fullest. The rivalry between the two companies produced some of the biggest hits of the decade – Namco's System Super 22 was the technology behind *Time Crisis*, *Prop Cycle* and *Alpine Racer*, while Sega's Model 2 series ran *Virtua Cop*, *Sega Rally* and *The House Of The Dead*.

» Twin sit-down racing cabinets of the Nineties were often able to be linked for increased player numbers.

"I kept turning on more and more objects on the screen, and was mesmerised by the power"

Mark Turmell

While this was going on, home consoles were rapidly catching up to arcade technology. Namco's PlayStation conversion of *Ridge Racer* wasn't arcade perfect, but it was close enough not to matter greatly – a fact which opened the arcades up to boards based on home console hardware as a budget option. The lower power didn't necessarily equate to a lower profile, though. Namco's PlayStation-based System 12 board hosted the likes of *Tekken*, while Sega's Saturn-based ST-V gave us *Die Hard Arcade*. Atari Games even got in on the act by licensing the Atari Corporation's Jaguar hardware for Area 51 and *Maximum Force*.

These cheaper boards were very attractive to developers too – particularly those who weren't able to stump up the research and development budget needed to take on Sega and Namco. Manufacturers like Konami and Atari Games were still producing custom high-end boards to power releases such as *GTI Club* and *San Francisco Rush*, but others such as Capcom and Taito simply relied on their own PlayStation variants for their 3D releases. Other developers didn't make the leap at all. Irem left the arcade market behind in 1994 due to poor sales, followed by Data East in 1996. SNK found the transition to 3D difficult after relying on the 2D power of the Neo Geo for so long – when the Hyper Neo Geo 64 arrived in 1997 it was expensive and behind the curve graphically, causing it to die a premature death.

DEVELOPER TOP PICK

JON RITMAN

"That's easy; *Battlezone*, and as soon as I started writing this I played it for 15 minutes. At one time in my life my place was party central and inevitably hunger would set in and someone would be sent to the local burger joint, not such a bad thing as there they had a *Battlezone* machine."

» SNK was one of the last companies on the 3D bandwagon, marketing games like *Metal Slug* instead.

It wasn't just the developers struggling to keep up. The pace at which technology was advancing meant that operators needed to invest heavily in new machines to stay relevant in the Nineties. Additionally, major attractions had become important to operators, but they came with a price. Dedicated cabinets with unique control methods like *Prop Cycle*, *Wave Runners* and *Rapid River* were great for drawing customers, but couldn't be upgraded with new kits like lightgun or racing cabinets could, leading to stagnating line-ups later down the line. Inevitably, these costs were passed on to players – the price of a credit would creep up over the course of the decade before settling around £1 for new releases.

It's ironic then that one of the great trends of late Nineties arcade gaming began with a small cabinet with low graphical power – *Beatmania*. Konami's 1997 release saw players spinning a turntable and hitting buttons on a keypad to match the notes dropping down the screen – a simple concept, but one which hooked thousands of gamers and has seen over 40 arcade releases to date. Konami, realising that it had a hit on its hands, quickly broadened the concept beyond the DJ simulator to other music-based games, introducing the similarly prolific *Dance Dance Revolution* in 1998, then *Guitar Freaks* and *DrumMania* in 1999. Other developers were taking notice, too – by 1999 Sega had given us the maraca-shaking favourite *Samba De Amigo*, Namco had introduced the *Taiko No Tatsujin* drumming series and Andamiro had introduced *Pump It Up*, a dancing series to rival Konami's *Dance Dance Revolution*. These games would initially become popular in Japan, but some canny localisation saw *Dance Dance Revolution* become a worldwide hit (albeit under the name *Dancing Stage*, in Europe).

While music games were ascending, other genres didn't fare so well. Despite the high quality of releases like *Spikeout*, scrolling beat-'em-ups were hard to come by towards the end of the Nineties, in part due to the difficulties faced by developers during the transition to 3D. Traditional shoot-'em-ups had also largely been confined to Japan, whether 2D or 3D. The advances in console technology meant that players were concentrating on the games which they couldn't get at home – and operators responded with their purchases, a fact reflected in the hits of the era. While the likes of *Crazy Taxi* and *Hydro Thunder* might have received excellent home conversions later on, it was hard to beat having a steering wheel and pedals.

By the end of the Nineties, arcades had lost their edge over mass-market home consoles, some major companies had fallen by the wayside and operators were feeling the pinch. But with the music game boom buoying the industry and hits still arriving in other genres, the outlook for the new millennium was good. Of course over a decade on, we know better – which brings us to the concluding part of our arcade history...

KEY EVENTS

1991
■ *Street Fighter II* is released, popularising one-on-one fighting games and earning Capcom hundreds of millions of dollars in sales.

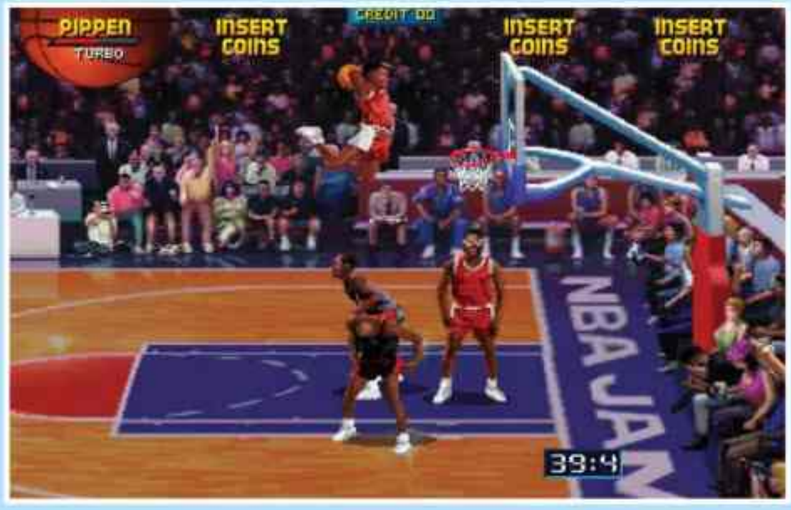
1993
■ Namco's *Ridge Racer* becomes the first game ever to employ texture-mapped polygons, a technique still used today.

1996
■ Sega opens Sega World in the London Trocadero, combining theme park-style attractions with six floors of arcade games.

1997
■ *Beatmania* launches in Japan, the first of Konami's many popular music games.

1999
■ *Buriki One* launches in Japan, becoming the final release for SNK's short-lived Hyper Neo Geo 64 board.

» *NBA Jam*'s success was enormous, prompting Midway to expand the formula to other sports with games like *NFL Blitz*. It didn't always work...



» *Time Crisis* ran on Namco's System Super 22.

MELODY MAKERS

We spoke to Paul Brookfield, the first UK Pump It Up player to qualify for the World Pump Finals, about the evolution of the arcade music game

Why did early games like *Beatmania* and *Dance Dance Revolution* have such a high impact?
Generally speaking, because they came with their own dedicated cabinets and were sound-driven games, they had a particular knack for catching attention in a row of machines. *Dance Dance Revolution* in particular also added a great blend of gameplay and physical activity, being particularly intuitive to first-time players and the double-edged sword of being humourous/embarassing to play.

What are the key considerations for developers bringing arcade music games to international audiences?
The absolute, number one rule is to make the games as unintimidating as possible. Konami's biggest music-game localisation success is without a doubt, *Dancing Stage Euromix*, which contained well-chosen licensed songs that had simple difficulty levels, which were offered to players first in the song list.

A competitive scene has developed around music games. How heavily are the needs of this audience factored into any development decisions?
Massively so. Although there is at least a moderate attempt to add low-difficulty and some licensed content to the games, the vast majority of the new instalments in the established series of music games are purely to satisfy the addicted hardcore. The *Beatmania IIDX* series is now 21 instalments old, and there are songs that on the top difficulty, have only been cleared by a small handful of people worldwide.

What are the key titles for people to play to get a grounding in the history of the genre?
I would recommend that people try the first *Dancing Stage Euromix* for a decent game that remains a shining example of a good localisation, and an instalment from the five-key original *Beatmania* series because it is the father of the modern arcade music game genre. Also, any instalment past the eighth mix for *Beatmania IIDX* for a taste of how far the series has evolved and just how truly, monstrously hard a music game can be.

END GAME

THE ARCADE AS A SIDESHOW

Nick Thorpe is your guide to an era in which the arcade industry is following gaming trends, rather than creating new ones

» Often, the credits display was all that visually distinguished arcade games from their home console counterparts.

THE STRENGTH OF ARCADE GAMES HAS ALWAYS BEEN THEIR ABILITY TO OFFER ENTERTAINMENT THAT YOU CAN'T REPLICATE AT HOME – BUT AROUND THE TURN OF THE MILLENNIUM, THE TECHNOLOGICAL BOUNDARIES BEGAN TO CHANGE.

Sega's primary arcade board was the NAOMI, essentially an arcade version of the Dreamcast, while Namco slowly shifted towards the PlayStation 2-based System 246. For the first time ever, the technology at the top of both home and arcade markets was the same, and dedicated arcades struggled as hardcore gamers looked elsewhere.

The number of arcades operating in the USA had slumped from 10,000 during the Nineties boom to just 3,000. As business conditions worsened, companies began to exit the market. Midway closed its arcade operations in the early part of the decade in order to concentrate on the home market, taking with it the recently absorbed Atari Games. In Japan, SNK's failing finances allowed it to be bought by Aruze, a pachinko manufacturer that stripped the Neo Geo manufacturer's assets and allowed it to become bankrupt. But while these companies disappeared, it's notable that new ones sprang up to replace them. "Sometimes you feel like a total dinosaur stuck in a time warp," says Eugene Jarvis, who founded Raw Thrills in 2001. "But then you go to an arcade and tap into the enthusiasm of the kids and you get massively jazzed about your next project." Meanwhile, SNK's intellectual property was quickly bought back by Playmore, a new company formed by SNK founder Eikichi Kawasaki that quickly entered the arcade market – though still reliant on the ageing Neo Geo hardware.

In an effort to retain the hardcore players, arcade manufacturers began to implement new hardware features. *Virtua Fighter 4* popularised the use of memory cards, which allowed players to track their wins and losses as well as customising their characters. Memory cards quickly proliferated across genres – from gun games like *Ghost Squad* to music games such as the *Beatmania IIDX* series, and even racing games like *Mario Kart Arcade GP*. However, international arcade operators didn't adopt the cards in huge numbers, meaning that they're still primarily found in the Asian market. Another major development was the addition of online functionality

A LONG WAY FROM HOME

Where arcade conversions once sold home hardware, in recent years you're far more likely to see arcade games using licensed products to entice players. While film licences like *Terminator: Salvation* and *Transformers* continue to do big business, you're now also likely to see familiar names from console and mobile gaming appearing in the arcade. The trend became noticeable around 2005 – while Global VR had been using EA licences such as *Need For Speed* for some time, they were joined by the likes of *F-Zero AX* and *Mario Kart Arcade GP* – takes on popular Nintendo series by Sega and Namco respectively. More recently, popular mobile games such

» Lightgun games are now one of two staple genres in the arcades.

to arcade games. Western releases such as the *Big Buck* series of hunting games often feature national high score tables and tournament features, while online multiplayer is usually reserved for Japanese games. The poster child for this approach is Sega's *Border Break*, a mech combat game that has generated over £60 million in sales since its introduction in 2009.

But the majority of arcade manufacturers today aren't making games for the long-departed hardcore gamer – they're making them for the people visiting theme parks, seaside resorts and bowling alleys. Though there are still dedicated arcades which are running at a profit, the locations that have best weathered the storm are US chains like Dave & Busters and Chuck E Cheese's, where arcade games serve as a supplementary attraction rather than the main draw. It's a simple change, but one that has required developers to adjust their development practices. "The arcade is a much more casual space," Eugene tells us, "so we have to make a game wider as opposed to deeper, and make sure every player has fun and a challenge. We have to go light on the punishment, even though it is always fun to see a player totally destroyed!"

The other major adjustment, at least as far as the Western market is concerned, has been the marginalisation of genres. Music games have suffered heavily, thanks to a combination of recession-fuelled conservatism and the boom (and subsequent decline) of peripheral-based music games on home consoles. Five new music games were introduced to the UK market at 2009's Amusements Trade Exhibition International show, but by 2013's European Amusement and Gaming International show the genre was absent as *Temple Run* and *Doodle Jump* have been adapted into hybrid products combining videogames and ticket redemption.

» Manufacturers now regularly utilise popular home console games to provide new products.

The use of home brands provides arcades with name value and often proven high quality, but the success of the conversion depends greatly on the approach taken by the arcade manufacturer. Konami's *Silent Hill* and *Castlevania* games were entirely new experiences, but proved to be heavy-handed adaptations that attempted to wedge both series into the lightgun shooter template. More successful was the *Mario Kart Arcade GP* series, which provided new content and didn't need to veer far from the design of the console games to provide a good arcade experience. The most prolific company has been Sega, whose European arcade team has worked with the likes of Sumo Digital and Codemasters to produce excellent arcade conversions of *Sonic & Sega All-Stars Racing*, *Virtua Tennis 4* and *GRID*.

» Arcade memory cards can become collectibles in their own right, featuring a variety of attractive designs.

» Lightgun games with big licences attached tend to perform well.

"It is always fun to see a player totally destroyed"

Eugene Jarvis

KEY EVENTS

2001

■ *Virtua Fighter 4* is released in August, popularising the use of memory cards in arcades.

2004

■ SNK Playmore releases its final game for the Neo Geo board in April, 14 years after its launch.

2005

■ Square Enix purchases Taito Corporation in September to enter the arcade market.

2006

■ Online coin-op news site Arcade Heroes launches in December, mixing player perspective with industry insight.

2011

■ The London Trocadero's Funland arcade closes in July, following a failure to meet rent payments.

and Konami, the genre's major player, was no longer providing arcade videogames to the UK. Meanwhile, traditional joystick-based games have almost disappeared. While some notable exceptions exist – *Super Street Fighter IV*, *Virtua Tennis 4* and *Pac-Man Battle Royale* have all arrived in the last few years – the market today is primarily composed of driving games and lightgun games. The result is that products are developed with those genres in mind. Where *Batman* was represented with scrolling fighters in the Nineties, in 2013 Raw Thrills adapted the licence with a driving game that harks back to the likes of *Chase HQ*.

But ultimately, that situation makes sense. "The arcade is all about physicality and human interface," Eugene tells us, and when you look at the new products to hit the market, the most successful ones hit a number of his key features – "Huge monitors, immersive racing cockpits and physical I/O like lightguns, motion cabinets, leaning motorcycles." No matter how impressive your home entertainment system, it doesn't offer domed screens, moving seats or air jets – and it probably never will. The likes of *Mach Storm* would lose something in the home, and it's this fact that ensures that arcade games remain in demand.

Despite the diminished status of the arcade in the bigger picture of videogames, Eugene's ambitions remain sky high. "Like bank robbers living for that one last job, arcade developers dream of creating the next humongous hit – the new *Pac-Man*, *Tetris* or *Angry Birds* that will catch the world on fire." Perhaps in the future, **Retro Gamer** will be telling the story of how Eugene created that new arcade sensation. We can only hope so.

» Music games were popular arcade attractions throughout the last decade, but lost out to home games like *Just Dance*.

THE BEST ARCADE IN THE WORLD

Funspot arcade in New Hampshire, USA, is a glorious reminder of the days when arcades ruled the gaming world. Paul Drury reports from retro heaven

FUN THREE

BOB LAWTON
OWNER AND FOUNDER OF FUNSPOT

■ Bob opened up the first Funspot in 1952 with his brother John, who sadly passed away in 2003. During the boom years of the Eighties, they ran Funspot arcades across New Hampshire and even as far afield as Florida.

GARY VINCENT
FUNSPOT MANAGER AND ACAM PRESIDENT

■ Gary took a summer job at Funspot in 1981 and never left. He was instrumental in creating the museum and he still spends many hours restoring old cabinets, ready to bring them onto the arcade floor.

MIKE STULIR
ACAM BOARD MEMBER

■ Mike is one of the many volunteers who devote their time to making ACAM such an extraordinary place. "I want to make sure these pieces of Americana are here for future generations to see and enjoy," he says, proudly.

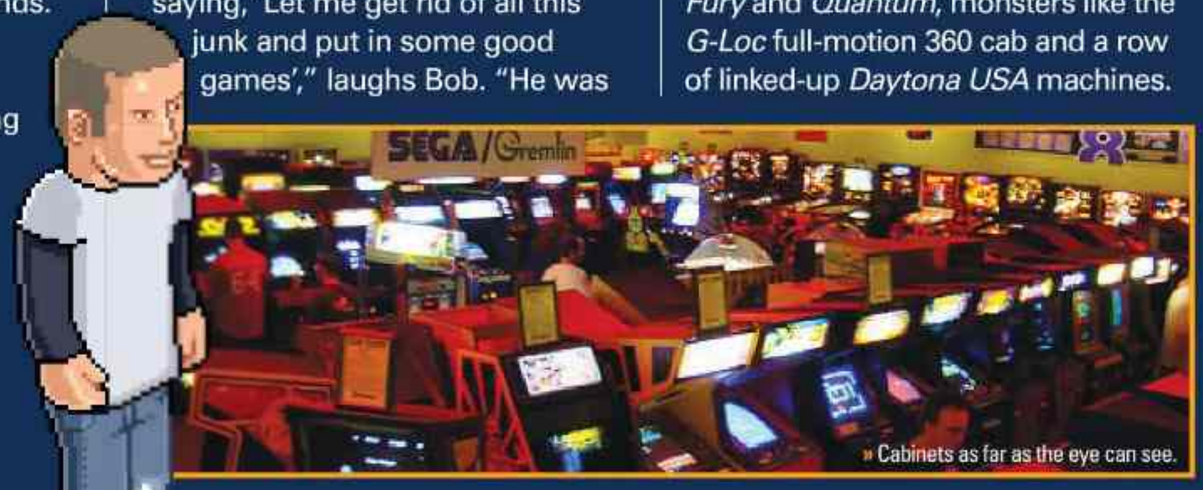
BOB LAWTON PATS THE HULKING *AFTER BURNER* COCKPIT CABINET AND SMILES. "WE PAID $11,000 FOR THIS IN APRIL 1987, WHICH WAS A HUGE AMOUNT OF MONEY BACK THEN. BY 1 JULY THAT YEAR, IT HAD PAID FOR ITSELF. PEOPLE WERE QUEUING UP TO PLAY IT!"

Bob, the founder and general manager of Funspot, can talk about any of the machines in his colossal arcade – officially named the biggest in the world by Guinness World Records in 2008 – as if it were an old friend. And Bob has a lot of friends. Over 600 machines are spread across three floors and walking through the building is like taking a tour through the history of arcades. You'll spot ancient baseball flicker games, electro-mechanical machines from the Sixties, scores of pinball tables and even one of those 'Love Tester' gadgets.

There's a whole mini-golf course, too; a sweet nod to the origins of Funspot. Back in 1952, Bob, fresh from graduating with a degree in chemistry, swapped test tubes for golf clubs and built a course on the second floor of the Tarlsen building in Weirs Beach, New Hampshire, a short walk from Funspot's current home. In partnership with his brother John, the pair built up the business over the following two decades, adding rifle galleries, a skee-ball alley and numerous other arcade attractions. Then one day in the mid-Seventies, in walked an animated Italian, who began gesticulating wildly…

"He was waving his hands and saying, 'Let me get rid of all this junk and put in some good games'," laughs Bob. "He was an operator from over in Concord and the first game he brought us was *Tank*. That one machine took more than the whole room of nickel and dime games we had. It showed us what videogames were going to do. I loved that guy. We stayed with him for years!"

So Funspot rode the videogame wave from the pioneering Seventies, through the Golden Age of the Eighties and into the last real hurrah of arcade cabinets in the Nineties. And they're all still here for gamers to enjoy. Classics like *Robotron* and *Asteroids*, obscurities such as *Space Fury* and *Quantum*, monsters like the *G-Loc* full-motion 360 cab and a row of linked-up *Daytona USA* machines.



» Cabinets as far as the eye can see.

» Bob Lawton (far right) regales his nephew Steve (centre) and RG's Paul Drury with tales from the arcade business.

» They just don't make upright driving cabinets anymore...

» Anyone fancy a two player game on, erm, anything...

» ACAM boasts over 300 cabinets, from old favourites to real rarities.

» Controversial game *Death Race* coexists with the inoffensive *Pong*.

We may be spoilt these days by having access to all these titles via downloads and emulation, but nothing beats the thrill of playing your favourites on an original cabinet in their natural arcade habitat – a habitat that has sadly almost vanished.

"I was noticing classic games were disappearing and arcades were disappearing," explains Gary Vincent, general manager and part of the Funspot family for over 30 years. "So at a staff meeting in September 1998, I asked if I could gather all the older games together, like a museum to celebrate the history of gaming."

Gary's idea slowly evolved into the American Classic Arcade Museum, or ACAM for short, a superlative collection of over 300 classic arcade games housed on the top floor of Funspot. Walking along the aisles of cabinets, admiring a pristine *Death Race*, smiling at the *Pac-Man* machine on which Billy Mitchell famously (or infamously, if you know the back-story) achieved his 'perfect game' and stopping for a sit-down on *Buck Rogers* is a magical experience.

Even the lighting, décor and background music has been lovingly chosen to recreate the arcade as it was in its Eighties heyday. "It brings back memories of when I first started here," says Gary, wistfully. "All the sights and sounds I remember from my first summer working here in 1981. It's kinda cool."

"Gary's a visionary," enthuses Mike Stulir, who sits on the board of directors of the museum. "He can recognise good ways to entertain and inform the public. We have students from computer development programmes use us as a resource. One college eliminated one of their course textbooks on the basis of what they could learn from us. Last time they visited, they brought three busloads of students to come and find out about gaming in the old days!"

Who said learning can't be fun? Whether you want to explore the history of videogaming or simply enjoy playing all the machines that consumed your pocket money as a child, ACAM is an essential visit for retro gamers. It's open all year round, though you may want to consider visiting during its annual International Classic Videogame Tournament in late May. Now in its 16th year, the event attracts the cream of arcade gamers from around the globe, meaning you can test your high scoring skills against numerous world record holders or at least grin as you spot famous faces from such films as *King Of Kong* and *Chasing Ghosts*.

When you do get to finally walk through the hallowed doors of this gaming mecca, make sure you check out the 'Retro Gamer Wall', where you'll find past articles on Funspot taken from our pages, and then seek out Bob Lawton himself and say we sent you. Despite being in his 80s, Bob still opens up the arcade every day and always provides a warm welcome. "I just love working," he laughs over a beer in the arcade's DA Long tavern, named after his grandfather. "My family all work here, too. It's my life!"

For more on this marvellous place, see www.funspotnh.com.

MUST PLAYS

COMPUTER SPACE 1971

■ This is where it all started. Inspired by the mainframe game *Spacewar*, Nolan Bushnell and Ted Dabney created their own simplified version, which became the first commercially produced cabinet. This sleek cabinet looks impressive, especially sat opposite Atari's *Pong*.

INDY 4 1976

■ This imposing four-player racing game greets you at the top of stairs as you enter ACAM and it's a poignant reminder of the arcade's long history. "It was the third videogame we got after *Tank* and *Seawolf* and during the summer of 1976, it was taking $140 a day," smiles Bob.

DOMINO MAN 1983

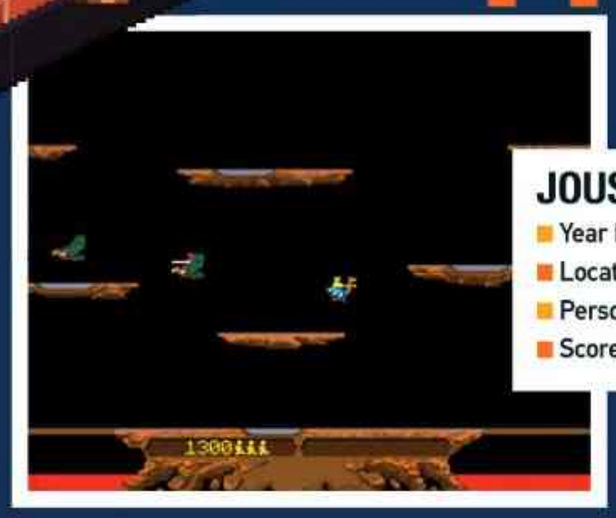
■ An excellent example of creative cabinet design, this game features a moustached, balding artist, who would soon swap his dominoes for beer mugs in *Tapper*. One of the many donations to the Museum since its official launch in January 2000, this one came from Randy Lawton, Bob's nephew.

WACKO 1983

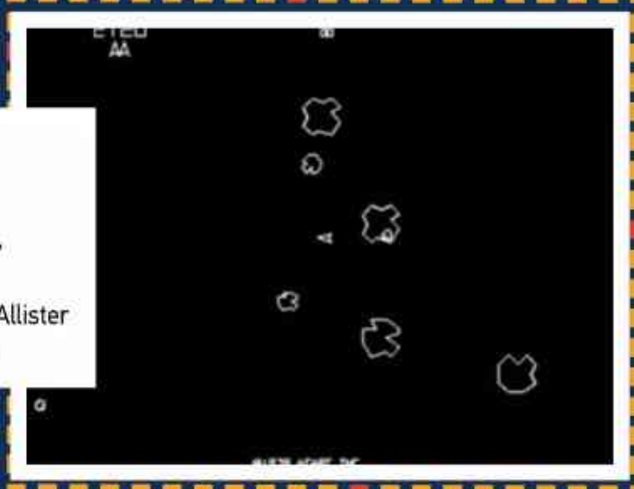
■ No, you are holding the magazine correctly. "This is from that era when manufacturers would do anything to make their game stand out," remembers Gary. "It must have cost lots more to make it crooked like that. I love that people went the extra mile with a bizarre cabinet like this."

SPACE HARRIER 1985

■ A compelling reason for why nothing beats playing a game on the original hardware, this full-motion cockpit cabinet tosses you through the Fantasy Zone with gay abandon. Modelled here by *Missile Command* champ Tony Temple, who put his back out shortly afterwards. Is the game worth the injury? Yes.



JOUST
- **Year Made:** 2012
- **Location:** Seattle, WA, USA
- **Person:** John McAllister
- **Score:** 107,301,150

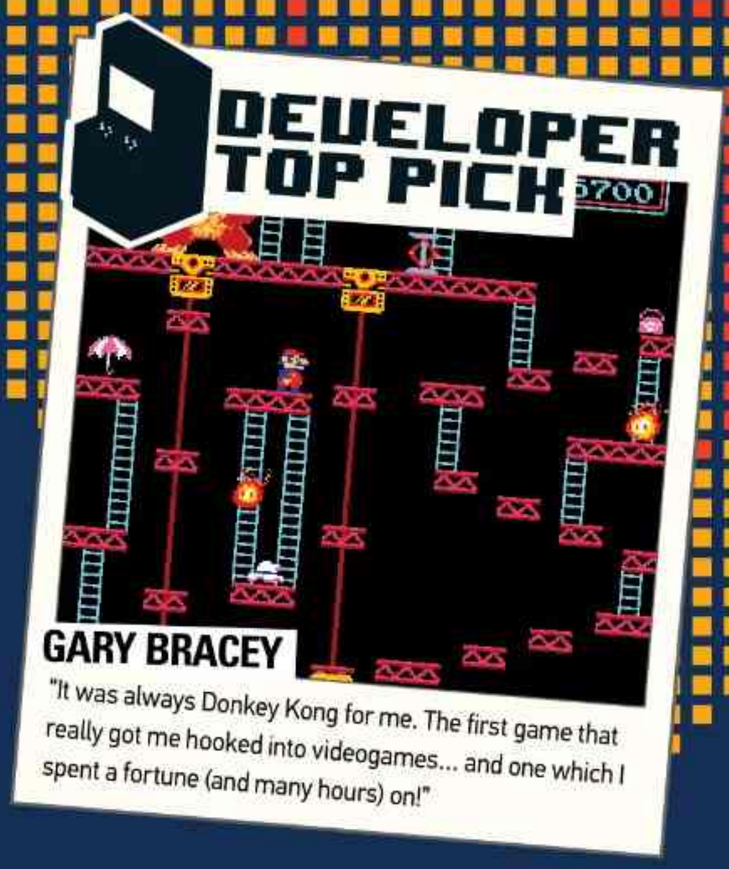


ASTEROIDS
- **Year Made:** 2010
- **Location:** Renton, Washington USA
- **Person:** John McAllister
- **Score:** 41,338,740

ROBOTRON
- **Year Made:** 2009
- **Location:** Renton, Washington USA
- **Person:** John McAllister
- **Score:** 1,236,950

SCORE KILLERS

Walter Day tells **Retro Gamer** about Twin Galaxies and the birth of score attacking


DEVELOPER TOP PICK
GARY BRACEY
"It was always Donkey Kong for me. The first game that really got me hooked into videogames... and one which I spent a fortune (and many hours) on!"

Why did you decide to travel America collecting high scores?

I loved playing videogames so much that I opened an arcade as an excuse to be able to play more and more videogames. It was called Twin Galaxies and it opened on 10 November 1981 in Ottumwa, Iowa. I practice Transcendental Meditation every day and, like many people who practice TM, I noticed increases in my mental clarity and eye-hand coordination. So, I was already very open to the idea that the best gamers would be people who were using more of their latent mental capacity and it would express itself in terms of higher and higher scores achieved in competitive gaming. So, I went on a personal quest to find the greatest gamers, the ones who could merge into a sort of higher-state of consciousness and out-think the program. And, such people would be recognisable by their unprecedented scores and unmatchable skill set.

When did you realise that the general public was interested in high scores?

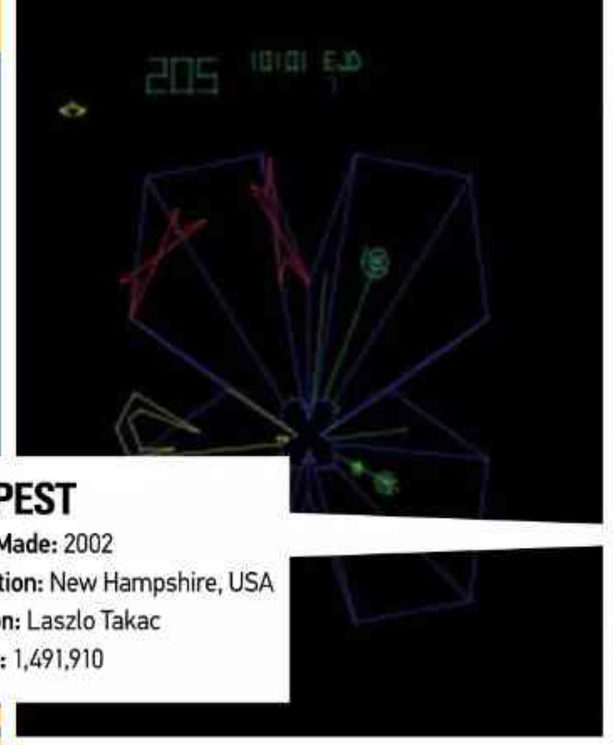
In 1982 a local gamer named Tony Mattan showed me a copy of the January edition of *Time* magazine. It had a cover story on videogames sweeping the world, and in the story was mention of one Steve Juraszek of Illinois who had scored 15 million points on *Defender*. Not surprisingly, the public was viewing this as the world record and people all over America were bent on breaking Juraszek's score. I allowed Tony Mattan to make a world record attempt and he did last for 24 hours, scoring about 24 million points. But, to my surprise, during his marathon the media began to call from far away cities like Kansas City, St Louis, Des Moines, Atlanta and Chicago, wanting updates on Tony's progress. This was only the beginning. Interestingly, as more and more high-score attempts began to manifest, Twin Galaxies would invariably be a part of each story in the media as we would be the adjudicators of the event. A media expert once estimated that Twin Galaxies was in the news more than 10,000 times during the 1982-1986 era, concluding that on any given day during that time there was someone going for a world record on a video game and the media was covering it.

How did you go from an oil broker, to a comedian and then owner of Twin Galaxies arcade? That's quite a trajectory.

Jon Bloch and I used to do Vaudeville-like skits, performing sporadically in the Catskills (Upper State New York) and in Iowa. And, also, I was an accomplished Rag Time Piano player, appearing on posters in the Eighties. Then, during the Spring and Summer of 1980, I was working in downtown Houston as an oil broker, creating deals between the majors (Conoco, Exxon, Tenneco) and the traders (Tesoro, Tosco and Apex). It was here in Houston that I found videogames as my true love and the first seed of desire was planted to someday own my own arcade.

PAC-MAN

- **Year Made:** 2012
- **Location:** Beavercreek, OH, USA
- **Person:** David Race
- **Score:** 3,333,360
- **Time:** 3:33:12.69 seconds



TEMPEST

- **Year Made:** 2002
- **Location:** New Hampshire, USA
- **Person:** Laszlo Takac
- **Score:** 1,491,910

DONKEY KONG

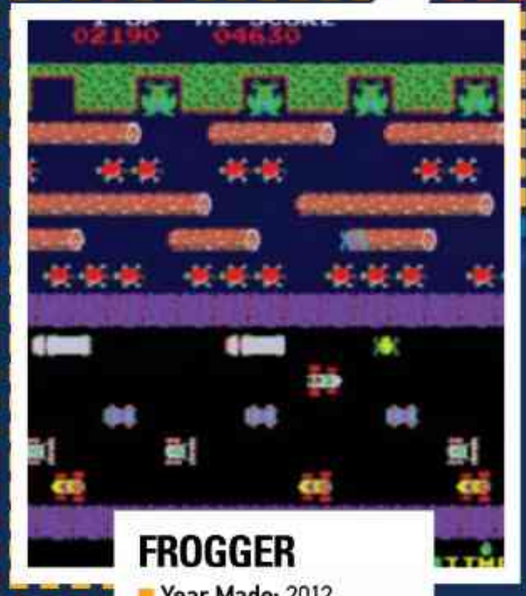
- **Year Made:** 2015
- **Location:** New York City, NY, USA
- **Person:** Robbie Lakeman
- **Score:** 1,141,800

SPACE INVADERS

- **Year Made:** 2013
- **Location:** Flemington, NJ, USA
- **Person:** Richie Knucklez
- **Score:** 184,870

Q*BERT

- **Year Made:** 2013
- **Location:** Flemington, New Jersey USA
- **Person:** George Leutz
- **Score:** 37,163,080



FROGGER

- **Year Made:** 2012
- **Location:** Virginia, USA
- **Person:** Michael Smith
- **Score:** 970,440

STAR WARS

- **Year Made:** 1984
- **Location:** New York USA
- **Person:** Robert T Mruczek
- **Score:** 300, 007, 894

How did it feel when Twin Galaxies was recognised by *The Guinness Book Of World Records*?

It happened in the summer of 1983. They had never recognised games because they were intimidated by the mass of details and variations in games and gameplay, acknowledging that it was a field that they were reluctant to try and master. So, they relied on our expertise. Our contests and adjudication supplied them with all their scores for the 1984, 1985 and 1986 books. And, then later, the 2008, 2009 and then much of the first four or five Gamer's Editions.

What's the ultimate arcade game for score chasing and why?

There are numerous games that test a man's soul. And, they are so difficult that it takes a major amount of practice and luck to raise your high score even 1,000 more points. They are all played on Twin Galaxies Tournament Settings (which means you get only a total of five men). They are *Robotron*, *Defender*, *Stargate*, *Q*bert* and *Missile Command*. And, of course, there is *Donkey Kong*, the most legendary contest game of them all.

When do you feel the golden period for scores was and why?

The Golden Age of High Score Competition lasted from 1980-1985. After that time, there were fewer arcades available and very few promotions or contests. By then, little inspiration remained to be a high-score champ.

What's the most impressive high score endurance test you've witnessed?

Recently, George Leutz, of New York City, lasted about 85 hours on one quarter, playing *Q*bert* to a new world record, eclipsing a record that had stood for more than 30 years.

Why did you leave TG and do you regret it?

I want to focus on the educational and historical aspects of our gaming legacy by creating a set of videogame trading cards that commemorate the history of the global videogame culture, honoring the iconic industry pioneers, the legendary game designers, the celebrated world champions and the historic milestones and landmark events. Plus, I am writing a musical based on my experiences running Twin Galaxies back when the City of Ottumwa became the "Video Game Capital of the World (1981-1984)." These new projects have me excited so I don't miss running TG.

Is it disappointing to see all your hard work currently undone?

TG is about to start up again under new leadership. So, all is well in the Video Game Capital of the World.

4

Pong

THE TENNIS CLONE THAT HELPED BUILD THE ARCADE SCENE

» RETROREVIVAL

» ATARI, INC
» ARCADE
» 1972

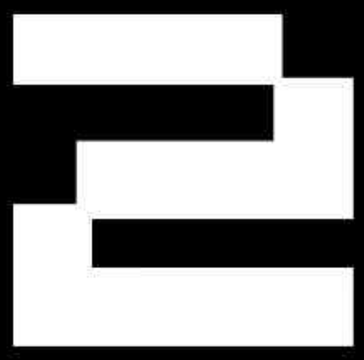
It's easy to take for granted today, but *Pong* was a huge deal when it appeared in 1972. It was one of the first commercially successful arcade games, paving the way for the likes of *Space Invaders*, *Pac-Man* and many other classics. It was enduring, too, and I can still remember some arcades having old machines when I was a young nipper in the late Seventies, early Eighties.

Pong really came into its own with a second player as it made the game amazingly competitive. Although you can only move your bat up and down, it's actually possible to pull off some insane moves with deft touches of the control dial. There's nothing more satisfying than having a long, drawn out rally before slamming past your opponent's defences with a cleverly angled ball.

It may have had archaic visuals and extremely simple sound, but it really didn't matter. *Pong* was a gateway into another world, a gateway that proved that monitor screens could create more than just passive entertainment, no matter how enjoyable it may have been.

While *Pong* enjoyed great success in arcades, it also dominated homes thanks to an insane number of official and unofficial clones that ported the game at every opportunity. My fondest memories are playing a variation of *Pong* that came with numerous other games on my aunty's Binatone system, but there were lots of other devices around and your own memories may be different.

Pong may seem old hat, but if you do manage to find a version to play, you'll discover that it's still ridiculously addictive.



Computer Space

If you spent your youth hunched over an arcade cabinet blasting aliens, Computer Space is where it all began. Paul Drury talks to Nolan Bushnell and Ted Dabney about the granddaddy of videogames

IN THE KNOW

- **PUBLISHER:** NUTTING ASSOCIATES
- **DEVELOPER:** SYZYGY
- **RELEASED:** 1971
- **PLATFORMS:** ARCADE
- **GENRE:** SHOOT-'EM-UP

It's summer 1966 and a young Nolan Bushnell, sporting sideburns but no bushy beard yet, is strolling through the Lagoon Amusement Park in Farmington, Utah. He's manager of the games department, working there to help pay his way through university. He smiles at the rows of pinball tables and electro-mechanical machines, guzzling coins from eager players.

Back at the University of Utah, Nolan is up late, playing *Spacewar!* in the computer lab into the early hours. The game, created by Steve Russell and friends at MIT in 1962, has two starship commanders locked in a deep space dogfight. It's a big hit on campus. And suddenly, a connection is made…

"I turned to the fraternity brother I was playing against and said: 'This is a great game! We could get people to put a quarter in to play this at Lagoon!'" exclaims Nolan. "I envisioned a row of screens running from a central computer, each with a coin slot. Then we looked around us at this million dollar computer and thought, 'Mmm, we've got a long way to go…'"

It wouldn't be until the next decade that, as co-founder of Atari, Nolan would see his vision of aisles of arcade machines realised. For now, the prohibitive hardware costs – Nolan estimates even the

display screens cost $20,000 – meant his videogame dream would have to wait. He graduated in 1968 and joined Ampex, a prominent American electronics company and pioneer in audio and video technology.

"I'd worked at Ampex for about a year, and as an engineer you get all these trade magazines," explains Nolan. "There was an ad in there that alerted me to the Data General Nova computer. Up to then, minicomputers were like $40,000, and then this comes along for $4,000 and I'm like, 'Woah, this might be good enough!'"

Nolan eagerly sent away for the manuals to this breakthrough machine and began making paper designs for a *Spacewar!* setup with four screens running from a single computer. With four coin slots collecting quarters, he hoped it could earn enough to pay for the high initial hardware costs and become a viable proposition to sell, not to bars, but amusement parks. "I told everyone at Ampex I was working on a videogame," smiles Nolan, "and they all thought I was loony."

Well, not quite everyone. Ted Dabney had joined Ampex in 1961, working in the military products unit for six years before transferring to the Videofile division in Sunnyvale, California. "I shared an office with Nolan and he took me over to Stanford to look at *Spacewar!*," recalls Ted. "I thought it was great... if you had a big enough computer! I didn't know if he was mad or not but I thought it was something worth trying."

Ted and Nolan teamed up with programmer Larry Bryan, who had access to a PDP computer and was to be responsible for the coding, and they began calculating how many games they could run from one computer. "We concluded there was no way it was going to work. It just wasn't fast enough," notes Ted.

"Plus Larry never got anywhere with the programming."

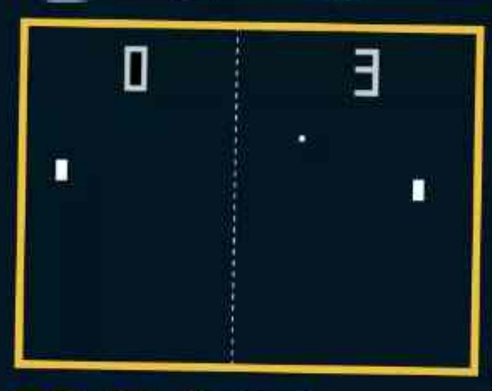
"The cycle time of the machines was simply too slow to support multiple screens," agrees Nolan. "Things like drawing the rocket ship still took a lot of computer time. We'd gone down from four, to three, to two screens. An electro-mechanical game cost around $900 and I thought we could charge a little more than that, but not $3,000 a screen! The economic proposition was gone..."

> "I told everyone I was working on a videogame and they all thought I was loony"
>
> NOLAN HAD THE LAST LAUGH, THOUGH...

And so the quest to bring videogames into the arcades almost died with the Sixties. Then, at the start of the new decade, there came

» The iconic *Computer Space* flyer. Nolan: "The girl was a topless dancer at a bar called The Brass Rail. It was done by Dave Ralston. We always thought he had a little thing with her but we never knew for sure."

» Former **RG** editor Martyn Carroll spotted this cabinet at E3 in 2004.



DEVELOPER HIGHLIGHTS

PONG (PICTURED)
SYSTEMS: ARCADE
YEAR: 1972

SPACE RACE
SYSTEM: ARCADE
YEAR: 1973

ISAAC ASIMOV PRESENTS SUPER QUIZ
SYSTEM: ARCADE (CHUCK E CHEESE EXCLUSIVE)
YEAR: 1979

an epiphany. Ironically, a game called *Computer Space* only became a reality when one key component was removed – the computer.

"Nolan's a smart guy and he was dicking around with a TV set, adjusting the vertical and horizontal hold and seeing the picture move," says Ted. "He asked me why that happens. I explained it to him and he said: 'Could we use this?' I said: 'Well, we'd have to do it digitally because with analogue we wouldn't have any control.' I explained we'd need a counter for the sync and one for the video and let the video counter change in respect to the sync counter. He said: 'Could we do that?' I didn't know yet..."

By replacing the expensive computer with circuitry built from cheap electronic components that could display and manipulate images on a standard television screen, the project was suddenly back in business. There was just one problem: the circuitry didn't exist. So, in 1970, Ted moved his daughter out of her bedroom and converted it into a workshop, where he began tinkering with an old telly and off-the-shelf components bought from electronics stores.

"I started by figuring out how to move something on the screen. It took me quite a while but finally I got these counters to do what I wanted them to, so you could change them by one bit and get very slow movement of a little square on the screen or by two bits and get faster movement. The next thing was, well, what are you gonna move? Nolan said: 'We need a rocket ship!'"

> "I got a little square moving on the screen. Nolan said: 'Now we need a rocket ship!'"
>
> TED JOINS THE DOTS...

The ship you command in your quest to outgun flying saucers intent on your destruction was fashioned from a series of dots, forming the outline of your craft. Each dot you saw on screen corresponded to a discrete diode on a circuit board inside the machine. These were arranged in a matrix, one for each direction the rocket ship could face. "What Nolan did was pretty smart," chuckles Ted. "He created the diode matrix and just before it went into production, he laid it out on the board, in the shape of the actual rocket ship, so if you had a problem, you could easily figure out what part wasn't working properly."

"Rotating the rocket was tricky," adds Nolan, "but the eyeball is quite forgiving. The dots are changing position on a 16x16 matrix and the places you put the dots aren't quite right, but by having the separation of the dots, your eye kind of fudges it and says, 'Yeah, this is the same rocket ship...'"

Now, we all know that in space no one can hear you scream, but blasting alien scum wouldn't be half

as much fun if performed in silence. Cleverly using a 6V Zener diode, a voltage regulating device that just happened to give off pink noise as it did its job, Ted added a little amplifier and an integrator that charged up and decayed to fade the volume out. "I built the sound circuits and motion circuitry," he says, proudly. "Then Nolan made them into a game."

At this point, **RG** is profoundly aware that we are talking about a game that, despite its huge historical importance, most of you have probably never played. Coming from a time before arcade machines used microprocessors, there is no 'code' for the usually helpful MAME to emulate, so unless you live near the Funspot arcade in New Hampshire, which has an actual machine in its classic games room, may we recommend the convenient 'simulator' found at **www.computerspacefan.com**, an excellent site that also catalogues the location of all surviving cabinets.

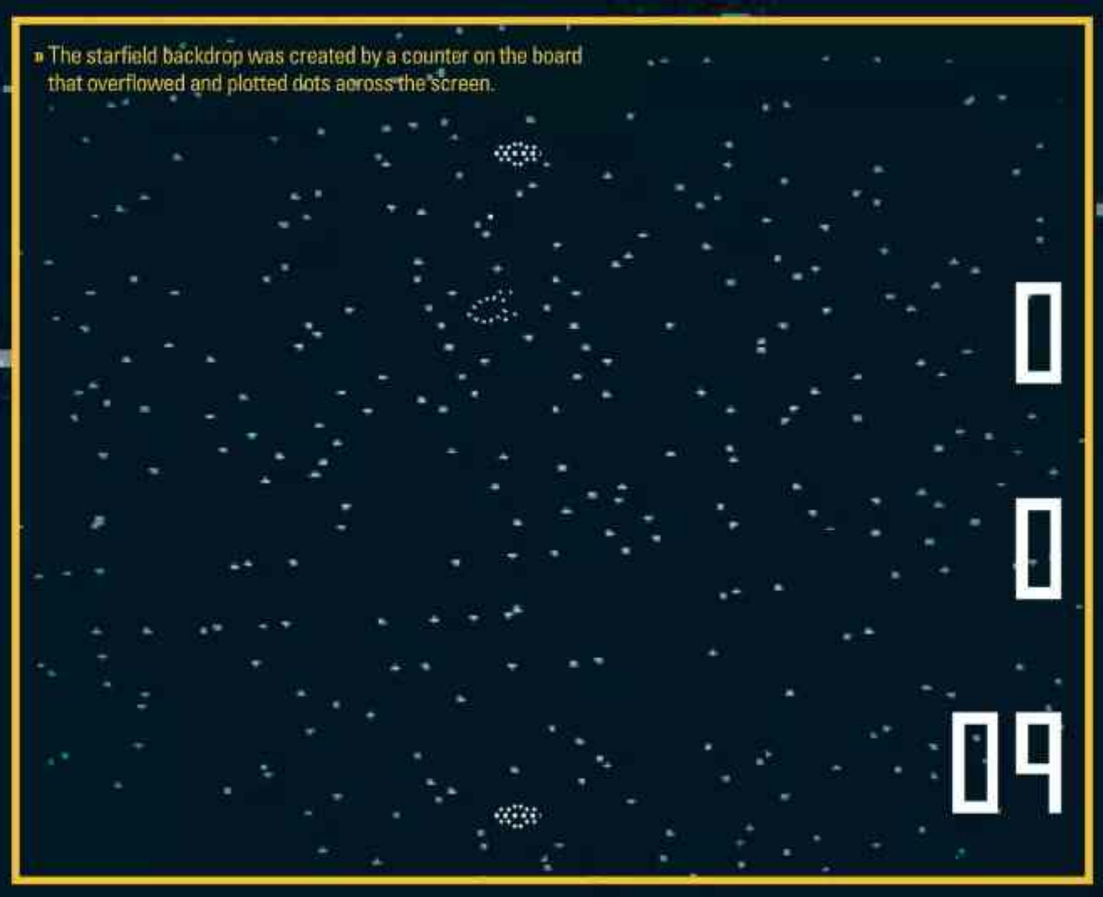
Once you've spent some time trying to blast those pesky saucers while dodging their bullets within a strict time limit, we think you'll notice several things. Although *Computer Space* is clearly inspired by *Spacewar!*, it is certainly no clone. It's a single-player game, for a start, and there's no central star exerting a gravitational pull either. We also think you'll be struck by the difficulty. Your ship is in perpetual motion, which may adhere to the laws of physics in outer space but proves rather inconvenient to *Asteroids* players, used to their ship slowing down and stopping if you leave off the thrust. This is further compounded by the deadly accuracy of your flying saucer foes. Why did Nolan seem intent on killing the first generation of videogame players with such regularity?

"The idea it was too hard never crossed my mind," he laughs. "All my friends loved it, but then all my friends were engineers. It wasn't until we put it into a beer bar and people were totally baffled that we thought maybe we've overshot our mark! As for making *Computer Space* a one-player game, the coin-op industry was based around solitary game players. I mean, Bally turned *Pong* down because it was two-player!"

With the game elements starting to come together, Nolan decided to present his idea to Nutting Associates. The California-based

BEND IT LIKE BUSHNELL

IF YOU'VE SEEN *Computer Space* in action, you'll notice that after launching a shot at those vicious saucers, you can 'bend' your bullet towards your intended target by rotating your ship. It's an ingenious feature, which later appeared on *Combat* for the VCS, though it emerges it was more a case of necessity. "The missile starts out from the front of the rocket ship, but when the ship moves, the front of the ship is in a different place on screen," explains Ted. "There was no way we could 'remember' a point on screen, so it had to move in relation to the front of the ship. Let's call it a guided missile!" Ted added in a clever feature to signify a successful hit, too. "I just inverted the video so the screen flashed white. It was a cheap, easy way to create the sense of an explosion." Ted also used this inversion technique to signal extended play and called it 'hyperspace', yet another debt that Atari's biggest hit, *Asteroids*, owes to its granddad...



» The starfield backdrop was created by a counter on the board that overflowed and plotted dots across the screen.

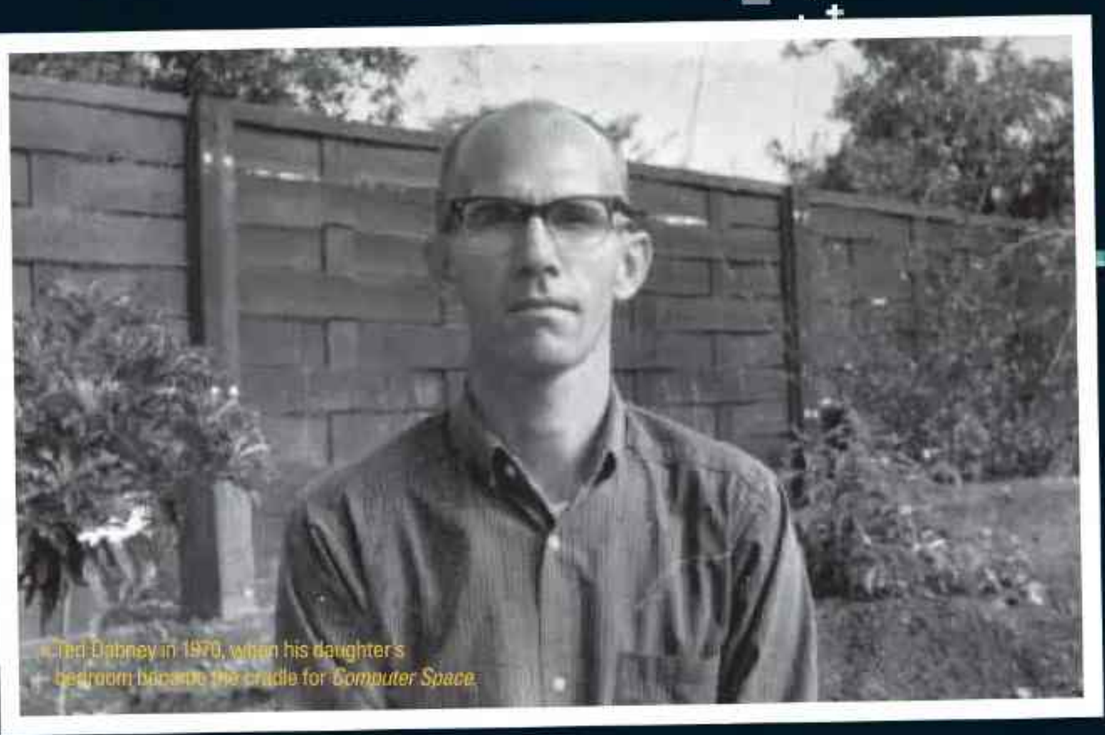
IN THE BEDROOM

SOME READERS MAY be aware of the ongoing dispute as to where the pioneering work on the *Computer Space* circuitry actually took place. For decades, it was thought that Nolan ousted his daughter from her bedroom to set up shop there but, more recently, Ted has gone on record as saying it all happened at his house. We asked Nolan to clear up the controversy. "The real answer is that it was in both," he explains. "Ted was doing his work and I was doing mine. Quite frankly, I had forgotten he was working in his daughter's bedroom as well. The blogs can get carried away. I fuelled it by saying once that I didn't think he even had a daughter. That was grist for the mill..."

Ted has a slightly different take on things. "My daughter Terri used to babysit for Nolan, so he knew I had a daughter, and his wife back then, Paula, would not let him do anything in that house. He didn't even own a soldering iron."

company had had considerable success in the coin-op industry with *Computer Quiz*, but with that product reaching the end of its commercial life, it was eager for new machines to manufacture. "I don't think they really understood what a videogame was, but they thought it sounded like a capital good idea," Nolan winks. "I'd only really got dots on the screen but I presented myself pretty well as an up-and-coming smart boffin – I was speaking British for you there – so they hired me as chief engineer. I left Ampex and was working for Nutting in the day, helping them finish up some projects, and at nights I was working with Ted on *Computer Space*. I specified in my contract I would retain rights to all the videogame technology, though."

The *Computer Space* circuitry had been coming together nicely, thanks to some assistance from an undergraduate on placement at Ampex by the name of Steve Bristow, and now that he had a position at a major player in the coin-op business, Nolan was



Ted Dabney in 1970, when his daughter's bedroom became the cradle for *Computer Space*

understandably enthusiastic about his groundbreaking project to bring *Spacewar!* out of the computer lab and into the arcades. Then he received some startling news. Someone else had had just the same idea.

As a student at Stanford in the mid-Sixties, Bill Pitts had been similarly entranced by *Spacewar!*. After graduating, he teamed up with school friend Hugh Tuck, whose hardware know-how and family money nicely complemented Bill's software skills. By the summer of 1971, their version of *Spacewar!*, entitled *Galaxy Game*, was almost ready to meet the public, when Nolan heard news of the project.

"I had some trepidation when I went over to see what they were doing," acknowledges Nolan, "but I had this suspicion that no one would have worked out how to do it as cheaply as I had. They had one in the coffee shop at Stanford, using a PDP-10, I think. I thought they'd done a great rendition of *Spacewar!*, but I did a quick costing and thought, 'This is no competition.'"

Nolan was right on both counts. *Galaxy Game* was far more faithful to the source material, but due to basing their machine around an actual computer rather than custom circuitry, it was hugely more expensive at around $20,000 in total and considerably more unreliable. Though it could never hope to recoup its cost in quarters,

> "When we put it in a bar, people were totally baffled"
>
> NOLAN UNDERSTANDS THAT COMPUTER SPACE IS HARD ENOUGH WHEN YOU'RE SOBER

Galaxy Game beat *Computer Space* to market by two months, debuting in September 1971, and thus has the honour of being the first arcade videogame. That original machine was replaced by a superior version the following year, utilising a PDP-11 that supported two play screens simultaneously, which remained in situ at Stanford's Tresidder Memorial Union throughout the Seventies. For more on this innovative oddity, see chapter two of *Replay*, Tristan Donovan's wonderfully readable history of videogames, or visit the machine itself in its new home at the Computer History Museum in Mountain View, California.

Undeterred, even encouraged by the appearance of this unexpected rival, Nolan pressed on, with Ted joining him at Nutting and proceeding to build a prototype cabinet ready for field-testing. The game debuted at the Dutch Goose bar in Menlo Park, California, in November 1971, with both proud parents accompanying their baby.

"Ted and I took it over in the back of my station wagon, and as soon as we plugged it in, there was an immediate cluster around the machine and play after play," enthuses Nolan. "We were convinced we had a major hit on our hands. But you see, the bar was a hangout for Stanford students, all smart as hell. Lots of engineers and maths and physics majors. Newton's second law wasn't a big problem for them! We put it in another few places and you could best describe the clientele as bimodal. They had no clue about what was going on. They'd say: 'I can't control this thing. How do you make it go right and left?' I remember trying to teach people about the thrust control and it just wasn't part of their DNA."

Worse still, the less cerebral crowd seemed to have taken their frustration out on the machine.

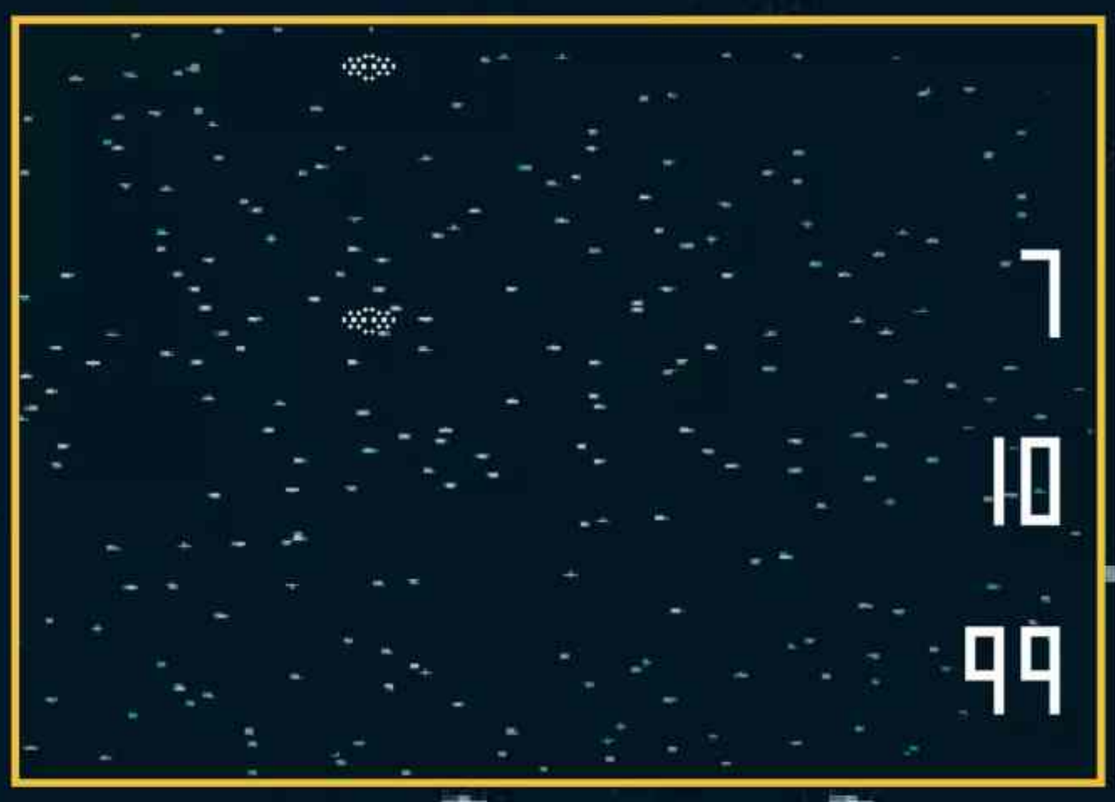
The prototype cabinet featured a joystick-cum-trigger controller, which snapped after a single day out in the field. For the version put into production, four buttons were used instead – rotate left, rotate right, thrust and fire – which may have bemused tipsy punters but was at least able to physically withstand their drunken advances.

More pleasing to players was the stylish cabinet the game sat within. "Form follows function," states Nolan. "This was a space game and so should have a space age cabinet. I made a model from Plasticine. I had a little bit of plastic for the screen and a piece of wood for the back, and moulded it to that shape. Ted found a fibreglass guy who figured out how to make it into the cabinet. I sent my model to the manufacturer and they scaled it up."

Fortunately, this didn't result in a Spinal Tap Stonehenge-style fiasco, and around 1,500 – although Nolan

» Controlling your ship can take some getting used to, thanks to authentic outer space physics.

70



» Nolan poses with a surviving *Computer Space* cabinet, of which less than 100 are accounted for.

thinks the figure may have been as high as 2,200 – of the futuristic-looking *Computer Space* machines were manufactured.

And the game flopped. Well, that's what the received wisdom seems to conclude. We wish to challenge this notion. The sales figures may have been dwarfed by future hits like *Pong* and *Asteroids* – which, you could argue, was a spiritual successor – but at the start of the Seventies, a successful pinball table would only sell around 2,000 units. It provided an income stream for Nolan and Ted, which helped to fund the *Pong* project. Indeed, when the very first *Pong* prototype was placed in Andy Capp's Tavern, it sat next to a *Computer Space* cabinet, convincing Nolan that, in gameplay terms, simplicity was the key to success. It was a philosophy that he and Ted would adhere to when they left Nutting and formed Atari the following year, thus kick-starting the whole videogames industry.

"I'm treated like a rock star. It's been 40 years coming and I love it!"

TED DABNEY IS LIVING PROOF THAT GOOD THINGS COME TO THOSE WHO WAIT IN THE GAMES INDUSTRY

"I felt this was a medium, not just a product," says Nolan. "Remember, there were more games on the computers at university than *Spacewar!*. I'd done a game called *Fox And Geese*, there was a baseball game… people were programming! I was very happy with *Computer Space*. When you create something with your hands as well as your mind, it has a special place in your heart."

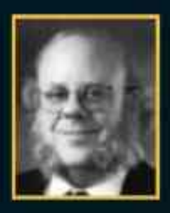
While Nolan went on to gain fame and fortune with Atari, Ted left the company in 1973, after an acrimonious falling out with his former friend. His crucial role in those early days of the games industry went unacknowledged for years, but recently, due to the efforts of games historian and author Leonard Herman, among others, the situation is changing.

"I don't give a diddly-squat about games," laughs Ted, "but getting this recognition is fantastic. I'm treated like a rock star. It's been 40 years coming and I love it!"

Thanks to Marty Goldberg and Jerry Jessop for their help with this article.

Space Men

We talk to three industry legends about their connection to Computer Space



STEVE BRISTOW

had several placements at Ampex while studying at the University of California at Berkley in the late Sixties and early Seventies. He later followed Nolan to Nutting Associates and worked on the two-player version of *Computer Space*, before moving to Atari, where he stayed until 1984.

"Nolan was my supervisor at Ampex and he had me working on some prototype circuits, which turned out to be portions of the memory and motion controller boards for *Computer Space*. I saw the schematics for the game in the office he shared with Ted and I saw pieces of the prototype in a more assembled form when I visited them at Nutting. I first saw the production version when I started working at Nutting in March of '72. Production was just starting in earnest and I was the only person who troubleshot and fixed the boards. Of course I told people what I was doing and how cool it was! I was responsible for assembling and maintaining the two-player version at the AMOA show in Chicago in November '72. After that, I returned to school and took over the 40 or so coin-operated games that Syzygy/Atari had placed all over Berkeley and Oakland. I had two *Computer Space* machines and one was in Larry Blake's, a bar at UC Berkeley, near a *Galaxy Game*, and I'm sure we out-earned it. The coin box was never overflowing, but, in fairness, it was a one-gallon paint can, which could hold a lot more than the *Pong* prototype!"

AL ALCORN

was a colleague of Nolan and Ted's at Ampex and was one of Atari's first employees. He created *Pong*, which became the first major hit for coin-op videogames. He stayed with Atari into the Eighties, working on such successes as the home *Pong* and the VCS.

"I first saw *Computer Space* when Nolan and Ted invited some of their Ampex friends over to Nutting. I thought it was an interesting machine but didn't expect it to be a great success. When I came to work on *Pong*, Nolan gave me a set of schematics for *Computer Space*, but I really didn't use them, as they were drawn in a style that made it difficult to understand. We discussed the fundamentals of his patented motion circuit and I went from there. Remember, Nolan told me *Pong* was going to be a home game, so it had to use far fewer chips than *Computer Space*! I remember Nolan and Ted talking about one of the first locations for a *Computer Space* machine at a mall. The machine had a prototype joystick and it was destroyed in a day. They gave up and went with buttons. I never actually serviced a *Computer Space* – Steve Bristow has more experience with that – but I do recall servicing a *Pong* cabinet at the Stanford student union and competing with a *Galaxy Game* by Bill Pitts. I would be scooping quarters out of our game while Bill was struggling with his."

ARCHER MACLEAN

has been in the games industry for over 30 years, creating such home computer hits as *Dropzone*, *IK+* and *Jimmy White's Whirlwind Snooker*. He also restores arcade cabinets and, among his large collection of pristine machines, is a beautiful blue *Computer Space*.

"I was hunting for a *Computer Space* for ages, and eventually one came up on eBay about 12 years ago. It was a bit dead and had a large foot sized 'kick' hole on the lower front. This didn't put me off as I believed I had the electronics skills to sort the PCB out and my mate John is an expert at candy-apple sparkly paint sprays on Sixties-style fibreglass beach buggies! When it arrived, it had an aged-looking two-page typed note lying in the bottom, which basically said, 'Any problems, call Nolan direct on (415) 961-9373'. I think he's gone a few places since then! Amazingly, it's been 100 per cent reliable since getting it working in 2001. The screen is an ancient valve-based TV, which takes a minute to 'glow' into life, and the chips used on the PCBs are Jurassic-era ECLs and TTLs. Most of them have had their ID chemically removed to prevent cloning back in the day. Once it was restored, it has been in great demand from museums and television companies. The best was when it was used for the actual film presentation at the 2009 BAFTA Fellowship award given to Mr Bushnell himself, nearly 40 years after he designed it."

INSTRUCTION MANUAL
FOR
NUTTING INDUSTRIES

NUTTING INDUSTRIES

When you think of the pioneers of the modern coin-op industry or the game console business, names like Bushnell and Baer come to mind along with companies like Atari or Magnavox. As Marty Goldberg shows, the last name Nutting deserves a similar level of reverence

While most talk of the early video arcade industry usually centres around Nolan Bushnell and Atari, there's another individual whose firms and their contributions to both video arcade games and the coin-operated amusements industry overall are arguably equally as important. Nutting Industries (NI), Milwaukee Coin Industries (MCI) and Dave Nutting Associates (DNA) were a succession of companies spanning a 17-year period of innovation, resulting in products that either redefined the way things were or led the way in showing how things were moving to become. All three were also created by the venerable David Nutting.

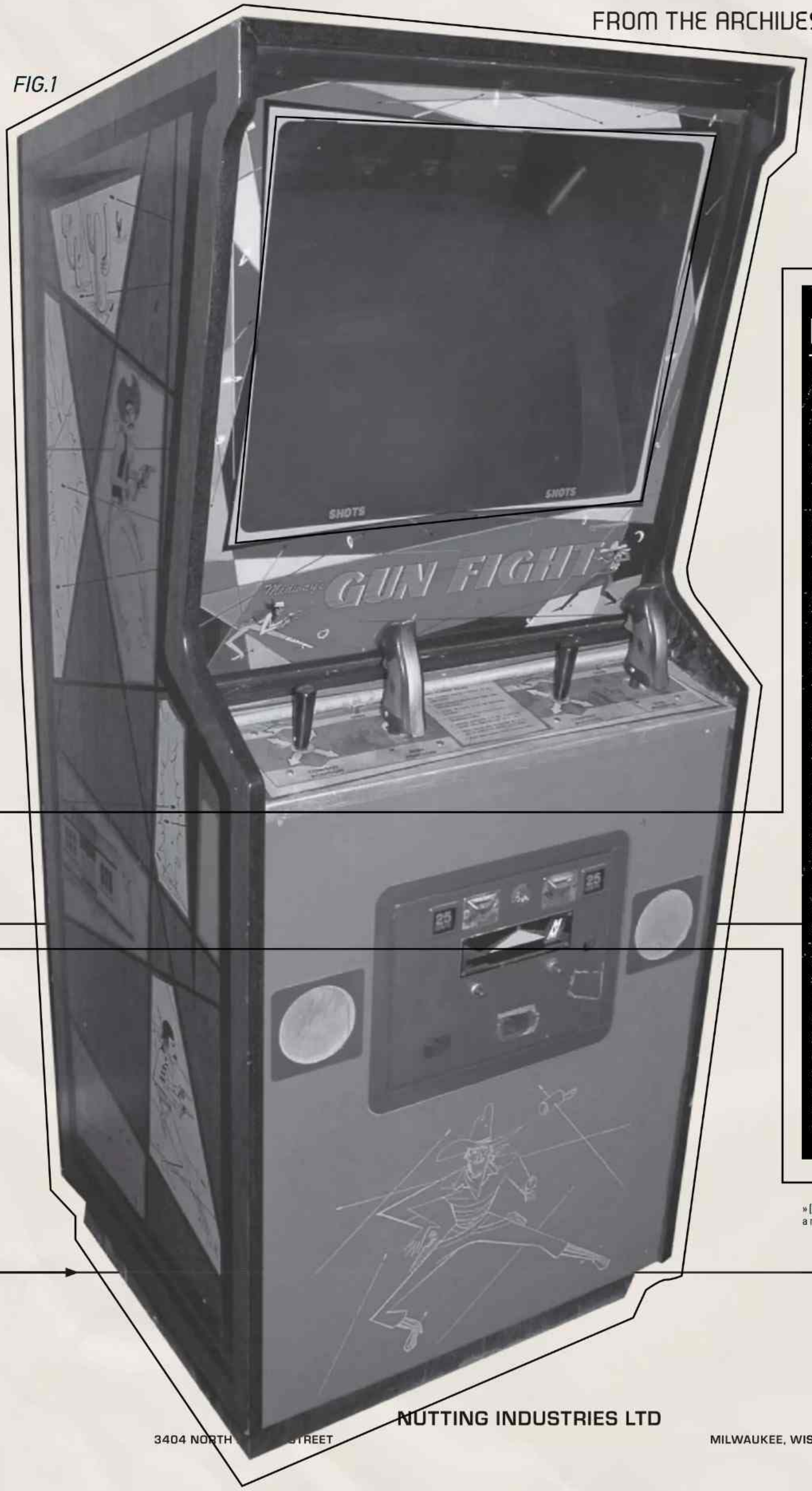
The story begins in 1966 when David was working at Brooks Stevens Design Associates, a product design firm with experience in every industry. Seriously, every industry. By this time Brooks Stevens had designed everything from the original Oscar Meyer Wienermobile to logos and packaging for Miller Brewing to the very first SUV, the Jeep Wagoneer, which David had assisted on as well. It was around this time in 1966 that David got a call from his brother, Bill Nutting. "Bill gave me a call and told me about his idea and asked me if I would be interested in repackaging his teaching machine into a coin-operated game," says David. That idea was a plan to get both brothers into the coin-op industry, an industry they knew nothing about, with a new 'game' based on a product Bill had been an investor in. That product, a teaching machine for the US Navy, was designed to test students by using a filmstrip projected onto a screen to ask multiple-choice questions. Students would then answer by pushing A, B, C, D or E buttons. During one of their meetings, one of the other investors jokingly suggested, "Why not put a coin slot on the quiz machine and make it an entertainment device?" So now here was Bill asking if he could leverage David's design and engineering background to do that very thing. "I want you to help repackage my group's multiple-choice teaching machine into a coin-operated quiz game," came the call to his brother David in Milwaukee, Wisconsin, setting up the same successful start-up formula mirrored later by Bushnell/Dabney and Jobs/Wozniak; the visionary and the doer.

As David recalls, "Bill was learning that coin-operated equipment was sold through distributors located in the major cities. Bill flew out to Milwaukee where we spent several days putting together a plan. At the same time, Bill visited distributors in Chicago, Detroit and New York, learning more about the

NUTTING INDUSTRIES LTD

3404 NORTH HOLTON STREET **MILWAUKEE, WISCONSIN 53212**

FIG.1



IN THE KNOW

- All three companies were started by the same person, David Nutting.
- They also all shared the same location, though Dave Nutting Associates eventually moved to Chicago.
- Dave Nutting Associates pioneered the use of microprocessors in pinball and videogames.
- *Gun Fight* was the first videogame with bitmapped graphics.
- Dave Nutting Associates also did the even more popular follow-up to *Gun Fight*, entitled *Boot Hill*.
- Programmer Jamie Fenton (*GORF*) started as a research assistant in a Robotics and AI Lab at UW-Milwaukee.
- *GORF* came from Jamie's college nickname, Froggy. "I had frog stuff all over my office. David wanted to do a shooting game (with the rifle on the trackball). He created a *GORF* character from that."
- Managers at MCI's Red Baron Amusement Centers weren't your typical arcade managers of the time. They were given training in working with people and the supervision of children.
- *Sea Wolf* was almost named 'Charlie the Tuna' thanks to executive Richard Welu during a period when Bally was licensing big names. It was pointed out that Charlie was a loser ('Sorry Charlie') and instead it was named *Sea Wolf*... by a night maintenance man who was a fan of the Jack London novel of the same name.

» [Fig. 1] Midway's *Gunfight* (1975). The first videogame with a microprocessor, thanks to Dave Nutting Associates.

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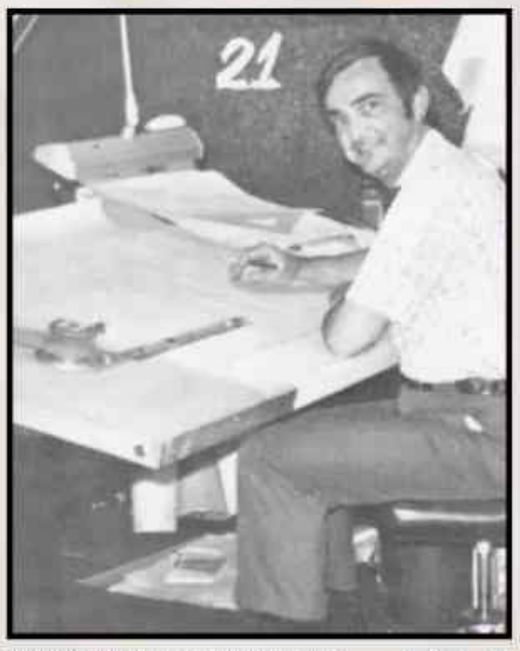
FIG.2



» [Fig. 3] David Nutting working at the drawing board in 1972 at MCI.

FIG.3

» [Fig. 2] The original headquarters for all three companies at 3404 N Holton Street in Milwaukee, WI as it appeared in 1972 when it was known as MCI.

TIMELINE

1967 I.Q. COMPUTER DEVELOPED. LAUNCHES NUTTING INDUSTRIES AND, TOGETHER WITH BROTHER BILL'S NUTTING ASSOCIATES AND THEIR COMPUTER QUIZ TWIN, OPENS UP THE COIN-OP INDUSTRY TO THE NON-TRADITIONAL LOCATIONS OF ARCADES, BARS AND BOWLING ALLEYS.

1970 RED BARON IS RELEASED. A HIGH-TECH ELECTROMECHANICAL GAME THAT USES FILMSTRIPS TO PROVIDE PRE-RENDERED FLIGHT SCENES, EXPLOSIONS AND EFFECTS FOR GAMEPLAY. PREDATES LASERDISC GAMES LIKE DRAGON'S LAIR, WHICH USED THE SAME CONCEPT.

1972 MCI IS FORMED FROM THE ASHES OF NUTTING INDUSTRIES. RED BARON AMUSEMENT CENTER DEBUTS LATER IN THE YEAR, THE FIRST ARCADE CHAIN CREATED AND OPERATED BY A COIN-OP MANUFACTURER (MCI). BALLY RESPONDS IN KIND TWO YEARS LATER WITH THE ALADDIN'S CASTLE CHAIN OF ARCADES.

1974 DAVID NUTTING AND JEFF FREDERIKSEN FOUND DAVE NUTTING ASSOCIATES AND CREATE THE FIRST MICROPROCESSOR-DRIVEN PINBALL MACHINE. THEY ALSO DEVELOP THE FIRST MICROPROCESSOR-DRIVEN VIDEO COIN-OP HARDWARE.

1975 BALLY SUBSIDIARY MIDWAY MFG RELEASES GUN FIGHT, THE FIRST MICROPROCESSOR-BASED VIDEO ARCADE GAME. DEVELOPED BY TOM MCHUGH FROM THE DISCRETE ELECTRONIC-DRIVEN GUN FIGHT BY TAITO, HE DOES SEA WOLF THE FOLLOWING YEAR BEFORE LEAVING FOR RURAL WISCONSIN AND RELATIVE OBSCURITY.

1977 BALLY RELEASES THE DAVE NUTTING ASSOCIATES-DEVELOPED HOME LIBRARY COMPUTER, LATER KNOWN AS THE PROFESSIONAL ARCADE AND ASTROCADE. DESIGNED TO BE A HYBRID GAME CONSOLE AND PERSONAL COMPUTER, IT'S THE FIRST WITH FULL-COLOUR HI-RES BITMAPPED GRAPHICS.

1981 MIDWAY MFG RELEASES JAMIE FENTON'S GORF. FEATURING SEVERAL GAMES IN ONE, INCLUDING VERSIONS OF GALAXIANS AND SPACE INVADERS, IT ALSO FEATURES SPEECH SYNTHESIS AND BECOMES AN INSTANT CLASSIC.

1988 MIDWAY MFG RELEASES DAVID NUTTING AND ALAN MCNEIL'S WIZARD OF WOR. WITH ITS CREEPY ORGAN MUSIC AND TAUNTING SPEECH-SYNTHESIS-DRIVEN LINES, IT ALSO BECOMES AN INSTANT CLASSIC AND ALONG WITH GORF IS IN GREAT DEMAND BY COIN-OP COLLECTORS TO THIS DAY.

1990 DAVE NUTTING ASSOCIATES IS SHUT DOWN BY BALLY. THE SURVIVING MEMBERS GO ON TO FIELDS SUCH AS QUANTUM PHYSICS AND SOFTWARE DEVELOPMENT.

business. My expertise was design and engineering and Bill's was in marketing. So our verbal arrangement at that time was that I would design and engineer the final product and Bill would be the marketing and sales. I had a good friend who was an electronic engineer with Cutler Hammer. Harold [Montgomery] designed all the circuitry and I designed the cabinetry and electromechanical devices like the projector."

The arrangement worked fine as the prototype was developed and tested successfully; that is until another relationship – one that usually takes a toll in any start-up – took precedence. Bill's wife Claire decided she didn't like the arrangement and played the divorce card, threatening to become another notch in a staggering statistic. Silicon Valley has the highest divorce rate in California, and California itself is 20% above the rest of the nation. Bill didn't want to become part of the statistic, so he called David and said he was going to manufacture the game in California and that David should shut down his operation. The news wasn't what David wanted to hear, but it was also obvious to David that the current working relationship he had with his brother wasn't going to work. He had already sunk way too much money into the operation to stop. So the brothers went their own ways and started their own companies to market the same game. Bill, under Nutting Associates, would be marketing it as *Computer Quiz* and Dave, under Nutting Industries, would be marketing it as *IQ Computer*. Setting up a manufacturing location at 3404 N Holton St in Milwaukee and hiring Eugene Wagner for marketing, David's game became an instant success (as did brother Bill's), though for a reason neither of them initially knew about.

The US coin-operated industry was in the midst of a long battle against the stigma of gambling and organised crime; something it would not shed until the 1970s when videogames took over the industry. New York State even had a ban on pinball games that lasted for over 30 years, treating them no differently than slot machines or other gambling devices. By the late 1960s, the industry had organised under the Music Operators of America (MOA). The MOA's existence owes itself to the age-old battle against the US music industry that Steve Jobs more recently fought in the format of digital rights management (DRM) and 'renting' of digital music. That being the music industry has consistently tried to squeeze every nickel and dime out of people's enjoyment of music that they could. The MOA was started in 1948 by a group of influential jukebox distributors and operators to fight against the repeal of the jukebox royalty exemption. It eventually grew to become a powerful organisation representing the entire spectrum of coin-operated devices, including electromechanical, pinball, pool tables, jukeboxes and vending machines.

At the time of the release of *Computer Quiz* and *IQ Computer*, the MOA had been working hard to fight the typecasting of coin-operated machines, specifically pinball – a stigma that had severely limited the number of locations operators could place machines. For instance in Los Angeles, California, about six hours south of where Bill was living, pinball machines were banned until the mid 1970s. The Nutting brothers' games proved to be the right tool at the right time as operators used the machines to work their way into new locations. Both games could go

FIG.4

NO.	DESCRIPTION		DRWG. SIZE
653	18 WHEELER 250 Concept System	3/23/78	
654	EDC		
655	BALLY BLACKJACK (PIN BALL U.R.)	4/10/78	
656	BALLY STRIKES & SPARES	4/17/78	
657	Video PinBall HOLD	4/24/78	
658	Home Computer add on	DNA	5/5/78
659	CRT memory " "		
660	Dual - Digital tape add on		
661	Light Gun		

» [Fig. 4] A page from Bally's own project logbook showing some of the projects being pursued in 1978. A fair portion were by Dave Nutting Associates (listed as DNA).

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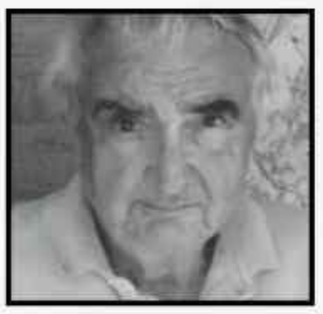
everywhere because of their perceived edutainment value. Operators would get into a location with the game, establish a relationship and then slowly bring in pinballs, pool tables and vending. In a lesson learned by both Nuttings and later leveraged by Nolan Bushnell with his creation of the fake competitor Kee Games, the fact that there were two manufacturers of 'Quiz' games also awoke the marketplace and opened up more operators and locations. In the amusement industry at that time, a great manufacturing run for a machine like a pinball was somewhere around 1,000 to 1,500. *Computer Quiz* had a run of 4,200 units and *IQ Computer* had a run of 3,600.

Over the next several years, David and Nutting Industries continued on the edutainment arcade game path using the same filmstrip technology, starting with a two-player version of *IQ Computer* called *Dual IQ Computer* and then various quiz replacement packs as well as another version of the unit, called *Golf IQ*. David also looked to diversify by hooking up with a manufacturer and distributor in London, England, creating a subsidiary to market non-coin-operated versions to educational institutions as Modec Inc, and by expanding into food service vending machines via some patents that Harold's father owned. It was the game offerings that needed to grow, however,

FIG.5

» [Fig. 5] The manual for Nutting Industries' *IQ Computer*. Together with its twin *Computer Quiz* by Nutting Associates, it opened up locations formerly closed to arcade games thanks to their seedy reputation over the preceding decades.

WHERE ARE THEY NOW?



David Nutting

Retired and living in Arizona, in 1984 David had moved to Colorado to study quantum physics. He's now the author of two books, the 2005 released *Language of Nature – Quantum World Revealed* and the 2012 *Secrets to a Creative Mind: Become the Master of Your Mind.*

Jamie Fenton

Jamie now lives in Sunnyvale, California. Spending the last 30 years working for a long line of game, graphic and software company start-ups, she currently works for Amazon's Lab 126 on the multimedia and performance teams for the Amazon Kindle and Kindle Fire tablets.

Alan McNeil

After creating the follow-up to *Berzerk*, called *Frenzy* for Stern Electronics, Alan also went on to do *Winter Games* and *Sub Battle* for Epyx, but has chiefly spent the last 30 years as a software developer writing apps across a plethora of platforms as a consultant.

"I wanted to be the industry leader and develop the first microprocessor pinball"

DAVID NUTTING ON OBTAINING INTEL'S FIRST MICROPROCESSOR DEVELOPMENT SYSTEM

and in 1969 they introduced *The Puzzler* designed by that same London firm. Ward Marty Johnson would replace Eugene as marketing head by the end of 1969, just as they were working on their most ambitious project. Initially titled 'Leisure Time Coin Game', by the time of its unveiling in October 1970 it was renamed *Sensorama*. The first arcade game to feature a professional sports tie-in, it was designed for placement at bowling alleys and featured 13 audiovisual bowling lessons given by pro bowler Dick Ritger.

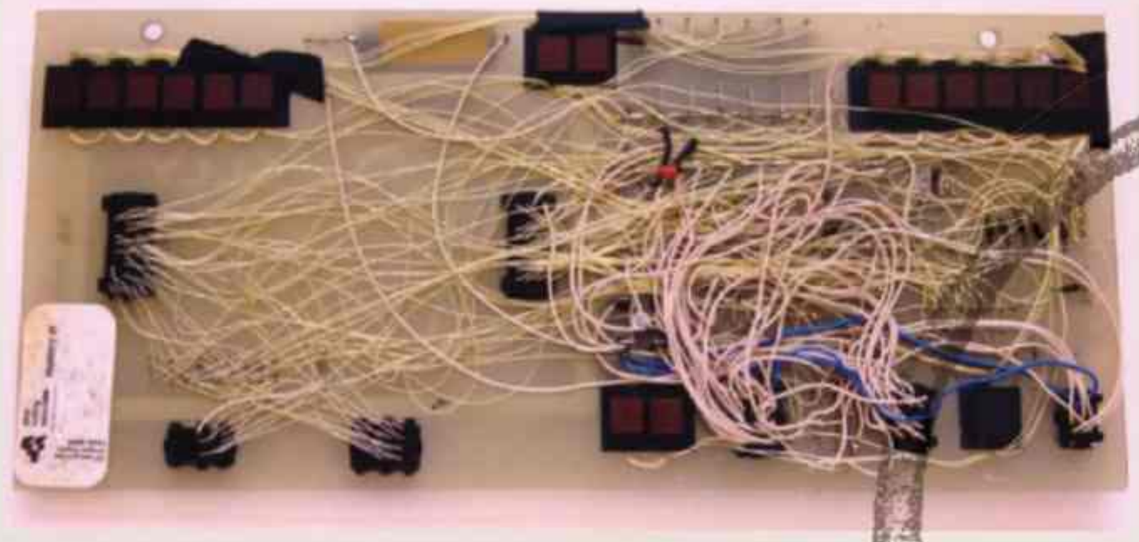
By 1970, though, it was clear that these educational arcade games were running their course, and with electromechanical (EM) arcade games already being dominated by the likes of Bally, Midway, Chicago Coin, Williams and Sega, a new format was needed. Brother Bill Nutting and his Nutting Associates got their new format in the form of video-display-driven arcade games when Nolan Bushnell had called up Bill's sales manager David Ralstin out of the blue. David was certainly open to the same synergy between new technology and games happening, and went so far as to place ads in local newspapers looking for people to submit ideas. However, overall he wanted to expand the projection technology into fully projected games based far away from the realm of quizzes. Looking to create a unique first-person experience with WWI airplane dogfights, in 1970 he began work on what would be the last game released under Nutting Industries, *Red Baron*. Using a pre-rendered animated film that functioned by jumping to different animations, much in the same way LaserDisc games like *Dragon's Lair* would some 12 years later, the player was given the sense of flying a WWI biplane into aerial combat. It was accompanied by recordings of actual machine-gun fire and plane engines along with haptic feedback in the form of the controls vibrating every time the plane's gun was fired. Unfortunately, Nutting Industries ran into bad financial problems afterwards, forcing David shut it down and start over…

It was in the exact same location, and with some of the same people, but on paper Milwaukee Coin

FIG.6

» [Fig. 6] A special coin David Nutting had minted to give out at the Music Operators of America (MOA) show in 1968 – the main coin-op show in America.

FIG.7



» [Fig. 7] The processor card for the Flicker pinball machine that David and Jeff retrofitted to use a microprocessor.

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FIG.8

» [Fig. 8] David Nutting's brother Bill with his most famous product, *Computer Space*.

FIG.9

» [Fig. 9] Jamie Fenton's video coin-op development station around the time of her games *GORF* and *Robby Roto*.

Industries (MCI) was a brand new company. MCI was carrying on where NI had left off and producing film-driven war-themed arcade games like *Blue Max*, *Desert Fox*, *U-Boat* and *Flying Ace*. However, it was the direction that David and the MCI board wanted to take in 1972 that really set MCI apart from other coin-op companies. Firms at the time sold to distributors and what are called operators, the people who actually run the machine on location. At the time, most locations were usually arcades, bars and bowling alleys. Coin-op companies might put their own machines out at these locations for testing during development, but they never actually owned the locations.

One of MCI's customers gave it the idea to change all that. During the 1960s, Jules Milman and his company American Amusements Inc had sought to wipe out the negative image of arcades by designing a new breed that were to be placed at the then new concept of mega shopping centres in the Chicago area, more commonly known as shopping malls. Called Carousel Time, these family-friendly locations with carpeting and a ban on smoking and eating on the premises were far different than their seedy penny arcade counterparts. The success of Carousel Time led the MCI board to decide it should look into running its own mall-based locations featuring MCI games. Based on the successful *Red Baron* game (which had spawned the recent *Super Red Baron* follow-up by MCI), the first Red Baron Amusement Center debuted in the Milwaukee area Mayfair mall in 1972. Within the year they had grown to about seven locations in the Midwest. Nolan Bushnell also tried to duplicate the idea in 1973 with Atari's own mall-based arcades in the San Francisco Bay Area, such as at Bay Fair Mall, but it never quite caught on (at least not until he combined it with pizza to create Chuck E Cheese). However, future David Nutting partner Bally did manage to succeed with its own in 1974… by purchasing American Amusements and rebranding it as the (more recently) well-known Aladdin's Castle.

With the success of the locations and the EM arcade game market starting to shrink during 1974, the MCI board wanted to concentrate its resources on the *Red Baron* locations. David, meanwhile, wanted to investigate the new form of electronics called microprocessors. The gateway into this futuristic world arrived via an Intel rep who had stopped by MCI to extol the virtues of the firm's soon-to-be-released 4040 4-bit microprocessor. He took new hire Jeff Frederiksen, who had experience programming a Burroughs mainframe computer, down to an Intel seminar in Chicago. "I wanted to be the industry leader and develop the first microprocessor pinball. I convinced them to sell us one of the first microprocessor development systems," says David.

Developed under a consulting contract with Bally, the pinball project also led to the creation of the final Nutting company in this article, Dave Nutting Associates. David formed DNA, a game engineering firm, as a partnership between him and Jeff Frederiksen in the early summer of 1974. On 20 August, Bally in turn sent them two Flicker pinball machines (a game yet to be released) to retrofit into solid-state microprocessor-based prototypes as proofs-of-concept. Completed by September, the new system was demoed to Bally management at the end of the month and over the next several years became the blueprint for the burgeoning microprocessor-based pinball industry, whose machines were distinguished by their glowing LED score displays.

DEFINING GAMES

Gun Fight 1975

Released by Bally subsidiary Midway Mfg, it was originally titled *Western Gun* and released by Taito in Japan. DNA turned it into a microprocessor-controlled arcade videogame, introducing software coding to the industry. According to David Nutting, its release caused a RAM shortage in other industries. It's also the first game to feature bitmap graphics, a concept only previously available in high-end graphics research systems at universities and corporations.

Sea Wolf 1976

Featuring a life-size periscope, it's essentially a videogame version of Midway's earlier electromechanical games *Sea Raider* and *Sea Devil*. Its advanced sound effects and first-person environment proved a big hit in the mid-1970s and it remained one of the most popular games of the period until Midway released Taito's *Space Invaders* in 1978. That same year, the sequel *Sea Wolf II* was also released, allowing two-player action with side-by-side periscopes.

Boot Hill 1977

The 1977 follow-up to *Gun Fight*, *Boot Hill* was programmed by Alan McNeil who later did the arcade classic *Berzerk* for Stern. Using dual joysticks to control the positions of the cowboy and his gun, it also features a colourful western backdrop that the game is projected onto via a reflective glass technique common in games of the period. Besides expanded gameplay, it also added a death song and burial of the player on the infamous Boot Hill.

GORF 1981

Jamie Fenton's classic shoot-'em-up features several games in one, along with speech synthesis: "We used the TI speech chip – sometimes [it] would vocalise using garbage memory and it sounded like people speaking in tongues." With levels that included licensed versions of Namco's *Galaxians* and Taito's *Space Invaders*, that reason alone is why there are not many *GORF* ports out there, according to Jamie.

Wizard Of Wor 1981

David Nutting and Bob Ogdon's game was inspired by the scene in *Alien*, where Sigourney Weaver is tracking the escaped alien via a small monitor. Using the same speech system and style of taunting as *GORF*, the standout feature is its very theme: the wizard. "When we put a voice into the machine, that got us into the mythology of who, exactly, was doing the talking. So we invented the Wizard. We used the Wizard to disrupt the flow of the game," explained co-designer Bob Ogdon to Arnie Katz in 1982.

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It was right around this time that the duo pursued their greatest accomplishment, however. The Intel 8080 had been released that past April, and according to David, "As soon as we were able to acquire the 8080 processor we developed our videogame hardware based on a mass RAM system. For every pixel on the screen we had a dot in memory, giving us full control of the entire screen." What David is describing is the frame-buffer-based process now used by every videogame coin-op and console known to man: bitmapped graphics. Already in use in high-end graphics research computers at the time, David and Jeff were the first to see its potential in videogames. Video arcade games and home consoles in that period were manually generating hardware-based sprites (called 'stamps' in coin-op industry speak), even once microprocessor-based games became more common. So the process they introduced was truly far ahead of its time, enough so they knew they'd need to look for some programmers to hire for future projects.

Jeff had been attending UW-Milwaukee at the time he joined MCI and studying under Richard Northouse, a professor in the School of Engineering and Computing. Approached for some students skilled in programming, Richard contracted out two: Tom McHugh and Jamie Fenton. Recalls Jamie, "I entered the game business a little reluctantly. All the tales about Bally being part of the Mafia etc. Since I was in Milwaukee, I did not know about the Chicago scene. For a few weeks we worked for Richard and were later hired on directly to DNA. My first assignment was 'Mirco Pin'. Mirco was a pinball company that Jeff and David pursued a relationship with independently of Bally. It was like the Bally Fireball but had more going on. After that I got to work on a blackjack game on the videogame hardware and that really impressed David. I remember the place [where DNA was located] vividly. It was a commercial space shared with the Red Baron arcade game chain, and there were a lot of games to play with. You just wandered around with an extension cord."

According to David, the first game they started for Bally subsidiary Midway on their new hardware was a baseball game (eventually released as *Tornado Baseball*), but it would be Tom McHugh's project that would hit the market first for Bally in November 1975: *Gun Fight*, Midway's licensed version of Taito's *Western Gun*. In a process similar to what they had done for the Flicker pinball machine, the game was gutted and retrofitted with the bitmapped microprocessor-based system they had designed. With *Gun Fight*, the video coin-op industry had just met its future. And as Dave further notes, it wasn't the only industry to be affected. "Our system used a frame buffer of RAM that would write to the CRT. RAM in 1975/76 was in short supply. In order to get a good price on RAM, Midway had to commit over three million dollars on their first release. This order consumed over half of all RAM in production in the world at that time, causing great shortages to other industries." Also according to David, Taito turned around and copied their 8080-based hardware for its game *Space Invaders*.

From there, the now classic *Sea Wolf* (by Tom) and the racing *280-Zzzap* (by Jamie) games followed, along with the previously mentioned *Tornado Baseball*. The string of hits led Bally to buy out DNA outright, and the group moved down to Chicago to essentially become Bally/Midway's research and design wing in the same way that Cyan was for Atari. It was followed later in the year by the start of the design of Bally's simultaneous entry in to the new home computer and programmable console markets: The Bally Home Library Computer. Created as a full-colour bitmapped personal computer and gaming console (the first bitmapped frame-buffered console, in fact) that could also be leveraged in new coin-op designs, it saw a mail-order-only release in September 1977, with wide release in 1978 as the Bally Professional Arcade. More hits followed for DNA, most notably *Wizard Of Wor* and Jamie's smash game *GORF*. However, the video coin-op industry went through a crash starting in '82, causing many firms to either downsize or leave all together. Sadly, DNA didn't survive and was shut down by Bally in early 1984. Interestingly though, this was just as Bally was acquiring the game firm Sente (founded by several ex-Atari coin-op engineers and helmed by none other than Nolan Bushnell), which would serve the very same purpose as DNA over the next four years. ✱

Special thanks to Keith Smith.

15
Action Graphics
In 1981, David Nutting and Bob Ogdon created a spin-off from DNA called Action Graphics to develop games for the Bally videogame system (at that time owned by Astrovision and renamed the Bally Astrocade). The firm was staffed by many of the same people under DNA who had originally been programming for the system when it was directly under Bally. Many of these games were direct ports of Bally/Midway coin-ops but under different titles, such as *Muncher* (*Pac-Man*), *Incredible Wizard* (*Wizard Of Wor*), and *Space Fortress* (*Space Zap*). Action Graphics also did original games like *Solar Conqueror*. As the third-party demand for other consoles like the 2600, 5200 and Colecovision started to explode in 1982 and 1983, Action Graphics started doing contract work creating games for many of these third-party companies, or in some cases porting games they had done on another platform. In an example of the latter, they did Activision's ports of *Beamrider* for the Atari 5200, Atari 8-bit computers, Colecovision and Commodore 64. Action Graphics lasted a year after even DNA had been shut down, though by that time (considering the collapse of the US console industry) it was doing mostly computer games.

"This order consumed over half of all RAM in production in the world at that time"

DAVID NUTTING REVEALS HOW GUN FIGHT'S PRODUCTION CAUSED A GLOBAL RAM SHORTAGE

FIG.10

» [Fig. 10] DNA developed this hybrid game console and computer system in 1976, released in 1977. It was later renamed the Bally Professional Arcade and then Astrocade.

FIG.11

» [Fig. 11] The back of the microprocessor-driven Flicker pinball machine's backglass showing the modifications Jeff and David made to support LED-based scoring (the first of its kind).

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PAC

PAC-MAN

CRAIG GRANNELL TALKS TO **TORU IWATANI** ABOUT HOW HE CREATED THE MOST ICONIC CHARACTER IN VIDEOGAMES HISTORY, DEVISED ONE OF THE MOST ENDURING AND COPIED GAME FORMATS, AND HOW HE REVISITED HIS CREATION FOR XBOX 360

With modern-day game characters often being designed and scripted to ape Hollywood movie stars, it's pleasing to note that a yellow circle with an insatiable appetite remains the most enduring videogaming star to date. After all, which gamer hasn't played some variant of *Pac-Man*? According to a May 2008 report by the Davie Brown Celebrity Index (dbireport.com), which scores celebrities to evaluate potential product spokespeople, *Pac-Man* was recognised by 94 per cent of US consumers, outstripping even *Mario*. *Pac-Man*'s appeal is, ironically, akin to Hollywood heavyweights like Tom Hanks.

Part of this appeal is no doubt down to the fun, peaceful nature of Pac-Man and his actions. He explores a simple maze, munching dots, pursued by a quartet of cartoon ghosts. When Pac-Man eats one of the maze's four power pellets, the ghosts turn blue and flee, having suddenly become edible and decidedly non-threatening. However, even when a ghost is consumed, its eyes 'escape', hastily retreating to the central ghost pen, whereupon it's reborn.

» Toru Iwatani with an altogether cuddlier version of Blinky/Akabei, along with similarly soft versions of Pac-Man.

This gentle, good-natured gameplay was no accident, as the game's designer Toru Iwatani explains. "In the late Seventies, videogame arcades, which in Japan we call 'game centres', were just playgrounds for boys, and the only videogames on offer were brutal affairs involving the killing of aliens," he remembers. "My aim was to come up with a game that had an endearing charm, was easy to play, involved lots of light-hearted fun, and that women and couples could enjoy."

Iwatani started thinking about videogame ideas in which the key word was the verb 'eat'. And, yes, the pizza rumour is largely true – suitably, while at a lunch, a fast-food favourite forever changed the course of gaming history. "With 'eat' established as the key word, a shape caught my eye," recalls Iwatani. "I had ordered a round pizza, and it was missing a piece." In a 'eureka' moment, Iwatani says, "the shape of what is now Pac-Man flashed through my mind."

Even in those early gaming days, videogame characters had a little detail, but Pac-Man was forever destined in his first

IN THE KNOW

- **PUBLISHER:** NAMCO/MIDWAY
- **DEVELOPER:** NAMCO
- **RELEASED:** 1980
- **PLATFORMS:** ARCADE, VARIOUS
- **GENRE:** MAZE GAME

HACK-MAN

With its efficient, simple gameplay and aesthetics, *Pac-Man* was popular fodder for the hacking brigade. Basic hacks involved minor gameplay tweaks, such as speeding things up, while slightly less basic hacks messed about with the maze, graphics and sound, adding to the original game's pristine polish a veneer of sticky and semi-random digital jam. The hideous *Joyman*, with its ghastly audio and broken maze layout, most notably kicked *Pac-Man* in the head with all the subtlety of a size-ten boot.

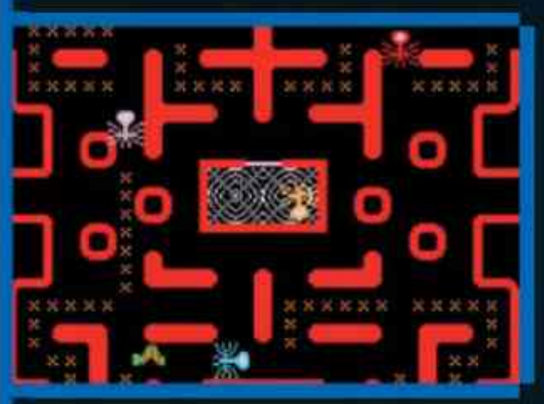
The most effective hacks are those that respect the original formula – *Hangly-Man*'s amended mazes – but GL's *Piranha* is an exception. Removing the maze and shifting the setting to a claustrophobic underwater cavern – the eponymous piranha pursued by ravenous octopuses – gives the game an edge in terms of focus and originality that other hacks typically lack.

incarnation to remain a yellow disc with a basic mouth, like an incredibly simplified version of Iwatani's lunch. He notes that some suggested at the time that other components should be added, such as eyes, but then there would be no end to the additions. "As design concepts, both Pac-Man and the ghosts have a simplicity and endearing charm," Iwatani says of his decision to keep the graphic design streamlined, also suggesting that the visuals of the game helped it appeal to female gamers of the day.

The elegant clarity of the character design also influenced the game itself. The food for Pac-Man to eat was initially strewn all over the screen, but Iwatani was keen to ensure gamers would immediately know what to do. "I wanted to simplify gameplay operation, and so the idea occurred to me of constructing a maze in which movement was restricted to the four basic directions – up and down, left and right," he says. With this structure in place, the game's objective became more obvious, and the lead character soon gained his moniker, 'Pakku Man', based on Japanese slang 'paku-paku', which describes the sound of the mouth while eating. (The original game's title subsequently became *Puck Man*. The US publisher, Midway, renamed it *Pac-Man* to stop wily hoodlums amending the 'p' in 'puck' to an 'f'.)

With the game's basic content dealt with, Iwatani realised it wasn't yet much fun, and so enemies were added to the mix, providing tension and excitement, and making it a challenge for players to grab food from the maze. Unusually for the time, Iwatani not only developed rudimentary artificial intelligence for the ghosts, but ensured each one had its own personality of sorts, due to moving and attacking Pac-Man in its own way. "The adversarial TV cartoon *Tom And Jerry* helped shape the relationship between Pac-Man and the ghosts," recalls Iwatani. "Had the programming been such that the four ghosts constantly attacked Pac-Man's present location according to the same algorithm, the ghosts would look like a string of beads. Where's the thrill in that? So I introduced AI-type algorithms that had the ghosts coming at Pac-Man from all directions."

And so we were introduced to Blinky, Pinky, Inky and Clyde (Akabei, Pinky, Aosuke and Guzuta in the original Japanese release). According to Iwatani, the ghosts attack in waves, before dispersing and attacking again, which gives the player some regular breathing space and appears more organic than the kind of incessant attacks that had plagued earlier arcade games like *Space Invaders*. (Over time, these waves are harder to identify, and the ghost attacks become swift and relentless, somewhat contradicting Iwatani's desire for a non-stressful game, but providing a necessary long-term challenge for seasoned players.) Although gamers often disagree with exactly how the algorithms work in practice, Iwatani has in the past stated that Blinky is designed to chase Pac-Man, but that Pinky's goal is to aim just in front of Pac-Man, hence why the two often seem to 'sandwich' the hero. The movement of Inky and Clyde is a lot more random, the end result being that Pac-Man is pursued in a



"I designed the game so players of any age and either sex could play it straight away, without reading a game manual" TORU IWATANI

» When *Pac-Man* won awards, it didn't mess about: these are for the 'most successful coin-operated game in history' and 'game of the century'.

natural way, rather than in a robotic, pre-defined manner, which makes the game seem more real.

The attacks aren't entirely one-sided, however; as noted earlier, the maze contains four power pellets, which temporarily transform the ghosts into a 'scared' blue form, enabling Pac-Man to turn the tables, hunt them down and eat them. "The inspiration for the power pellet was the spinach in the TV cartoon Popeye," explains Iwatani. "The power pellets didn't exist in the planning stages at all – they emerged during the development stage as a feature for turning the game around, and made the game vastly more interesting."

Although the completed *Pac-Man* ended up shipping well over quarter of a million units, Iwatani notes that the game's impact wasn't immediate: "In Japan, the game met with a lukewarm reception at first, but it then proved to be a long seller over several years." Amusingly, its success in the USA also took people by surprise, with 'experts' of the time judging *Rally-X* to be 1980's game to watch. However, Iwatani's ability to attract all kinds of gamers, rather than just teenagers keen on blowing up aliens, hit home. "Overseas, it was a massive hit – people who normally didn't play videogames became avid fans, and there was much media coverage of the playing of *Pac-Man*," he recalls.

The game has also stood the test of time, being converted to myriad platforms, and it regularly appears on compilations and various online services to this day. "I designed the game so that players of any age and either sex could play it straight away, without reading a game manual," says Iwatani of his creation's enduring popularity. "The game also contains numerous detailed stratagems for reading the players' psychology."

Perhaps unsurprisingly, Iwatani claims he'd not revise his game, given the chance to go back and do so. "At the design stage, there was a 'shutter' feature, which opened and closed, acting as an obstacle in the path of the maze," he says. "But I'd change nothing from the final game. Why? Because *Pac-Man* is complete to such an extent that to add or to subtract anything at all would be unacceptable."

Despite having worked on a range of titles over the years, including *Time Crisis* and *Ridge Racer*, it's clear Iwatani's heart always remained with his disc-based creation. During the

» Semicon's mid-Nineties *Hyper Pacman* provides an almost *Bomberman*-like take on *Pac-Man*, throwing strange boss fights into the mix.

CONVERSION CAPERS

With myriad Pac-Man conversions available, we look at the most curious examples

ATARI 2600

Embarrassingly drawing attention to itself via an 'Atari National *Pac-Man* Day', this conversion supposedly resulted from marketing pressure. A flickering mess, the game's dreadful maze layout and ropey gameplay led to a shortfall in sales, with five million cartridges left gathering dust.

VIC-20

While most VIC-20 owners had Atarisoft's dire conversion, Japanese Commodore fans were enjoying HAL Laboratories' superior take on *Pac-Man*. Commodore renamed the game *Jelly Monsters* outside of Japan, but fell foul of Atari's legal hammer of doom, and withdrew the game.

MSX

Namco's 1984 MSX release eschewed the horizontally stretched mazes of most home conversions, instead shifting the score display to the side of a smaller maze that retained the arcade parent's aspect ratio. This device remains in use today – eg: in *Pac-Man* plug-and-play TV games.

FUJITSU FM-7

Instead of following the MSX conversion's method of dealing with varying aspect ratios between arcade and home screens, 1984's Japanese FM-7 *Pac-Man* release rotates the maze by 90 degrees. This means no stretched maze and no weeny graphics, but the change disorientates.

GAME BOY ADVANCE

A touch of the crazies descended over Nintendo HQ when the NES Classics line reached Europe. With collectable boxes ditched and prices raised, you got a botched port of the bog-standard NES conversion for more than the superior *Pac-Man Collection* cost at the time. Nice.

iPHONE

The *Pac-Man* conversion for Apple's handheld is mostly unremarkable and accurate, but the lack of tactile controls results in curious control methods: 'swiping', an on-screen D-pad, and tilting to move Pac-Man. Swiping works best; directions are confirmed via an on-screen joystick.

PAC-MAN MILESTONES

A brief overview of notable arcade-based

MS PAC-MAN (1981)

Fed up waiting for Namco's *Pac-Man* sequel, US distributor Midway struck a blow for gender equality by releasing GCC's *Pac-Man* hack. Along with speeding up the game and amending the hero, *Ms Pac-Man* includes new mazes, more varied ghost behaviour and moving fruit.

SUPER PAC-MAN (1982)

Namco's *Pac-Man* sequel disappointed many outside of Japan, due to the fact that the gameplay was substantially altered. You still clear mazes, but munch targets behind gates that open when keys are guzzled. A 'super power dot' makes Pac-Man grow Hulk-like, to devour everything in his path.

JR. PAC-MAN (1983)

Midway again did the naughty, creating this effort without permission, and Namco terminated Midway's licensing agreement. Namco still doesn't recognise the game as official. With its scrolling levels obliterating the original's tightly honed strategic gameplay, it's easy to see why.

» A rampaging *Pac-Man* on level one devours a ghost before laying eyes on the cherries. Meanwhile, a resurrected Pinky sets out for revenge.

» *Pac-Man Arrangement*, released in 1996 as part of *Namco Classics Collection Vol.2*, is a successful *Pac-Man* update, with pretty graphics and interesting new features.

DEVELOPER HIGHLIGHTS

LIBBLE RABBLE! (PICTURED)
SYSTEM: ARCADE
YEAR: 1983

PAC-LAND
SYSTEM: ARCADE
YEAR: 1984

RIDGE RACER
SYSTEM: ARCADE
YEAR: 1993

Eighties, he was involved in both *Pac-Land* and *Pac-Mania*, with the former being his favourite. "It pioneered action videogames in which the scene flows horizontally. According to its creator, Shigeru Miyamoto, Nintendo's *Super Mario Bros.* was influenced by *Pac-Land*," he says, proudly.

However, it was during 2006 that Iwatani finally got the chance to both return to *Pac-Man*'s roots and design a brand new engaging, modern-day evolution of his original creation. Instead of the arcades, the chosen platform was Xbox Live Arcade, and the game became *Pac-Man Championship Edition* (*PMCE*).

"The time was right for a next-generation *Pac-Man*, because the Xbox Live Arcade environment supports real-time competition with score-ranking via the internet, and improved design through its hardware specification," explains Iwatani about the origins of the highly acclaimed game. "My aim with the game was to achieve legitimate evolution, with simplicity of game design and absence of the superfluous as my guiding principles, because, in my opinion, few players look for complexity in gameplay."

Guided by the same ground rules that defined *Pac-Man* – immediacy, simplicity, immunity to language and cultural differences, and "that sense of wanting to play and have fun, which is what the world's videogame players are looking for" – *Pac-Man Championship Edition* broadly retains the original's core gameplay, tasking the player with navigating a maze to eat dots, fruit and power pellets and avoiding roaming ghosts.

However, some major changes were made to the formula, in order to keep the game relevant and ensure it was more than just the original game reskinned.

Rather than the player having to clear a maze to proceed, *Pac-Man Championship Edition* plays like a time-attack game, and the player has a strict time limit in which to score as many points as possible. As with *Pac-Man*, this is done by consuming dots and 'scared' ghosts, but the longer you stay alive, the more each dot is worth (and the faster the game becomes). Also, the maze is now split in half. Clear one half of dots and bonus fruit appears in the other; eat said fruit and new dots are spawned in the previously cleared half. "The horizontal maze came about due to the prevalence of widescreen displays," explains Iwatani, noting that the split-maze device also creates non-stop action, unlike the original *Pac-Man*, which 'interrupts' players upon a level's completion. "And the timeout feature increases the sense of speed and excitement in the game, making it a very thrilling experience to play. Also, score ranking via the internet provides competition, which has been a great success." Iwatani adds that one of the key aims was to have people worldwide competing, the logical modern-day equivalent of Eighties' high-score table on the original *Pac-Man*. It works brilliantly, ensuring you'll always want to return for one more game.

Perhaps ironically, *PMCE* was, unlike *Pac-Man*, critically acclaimed right from the start. 1UP.com ranked it alongside *Geometry Wars* in terms of a classic game format being reworked, noting that

Pac-Man follow-ups

PAC & PAL (1983)

Here, Namco again moved further from the original *Pac-Man*. Ghosts can only be stunned rather than eaten, and now flipping cards opens gates to reveal items. The 'Pal' of the title is the infuriating Miru, who makes off with your bonus items, taking them to the inaccessible ghost pen.

PAC-LAND (1984)

Pac-Man finally left the maze, gained legs, arms and a face, and was tasked with battling through this early side-scrolling arcade game, its levels peppered with *Pac-Man* imagery. Although repetitious, the game is initially fun and it's more successful than Namco's previous two efforts.

PAC-MANIA (1987)

Pac-Man finally returned to his roots in *Pac-Mania*, although as you can see his surroundings are markedly different. The isometric maze scrolls, and the ghosts tend to roam in packs. Although, in Pac-Man's favour, he can now jump and he occasionally finds bonus items that speed him up.

» Several levels in and the ghosts become faster – you have little time to eat them after eating a power pellet.

» *Piranha* is a decent *Pac-Man* hack, removing the maze and thereby creating a different and tougher game.

With grateful thanks to Tetsuya Hayashi for invaluable assistance in realising this interview.

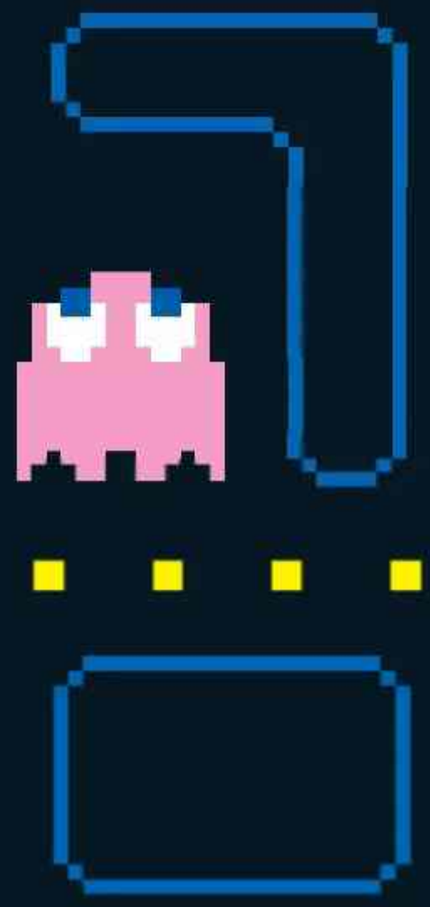
"Pac-Man's guiding principle is 'fun first'" TORU IWATANI

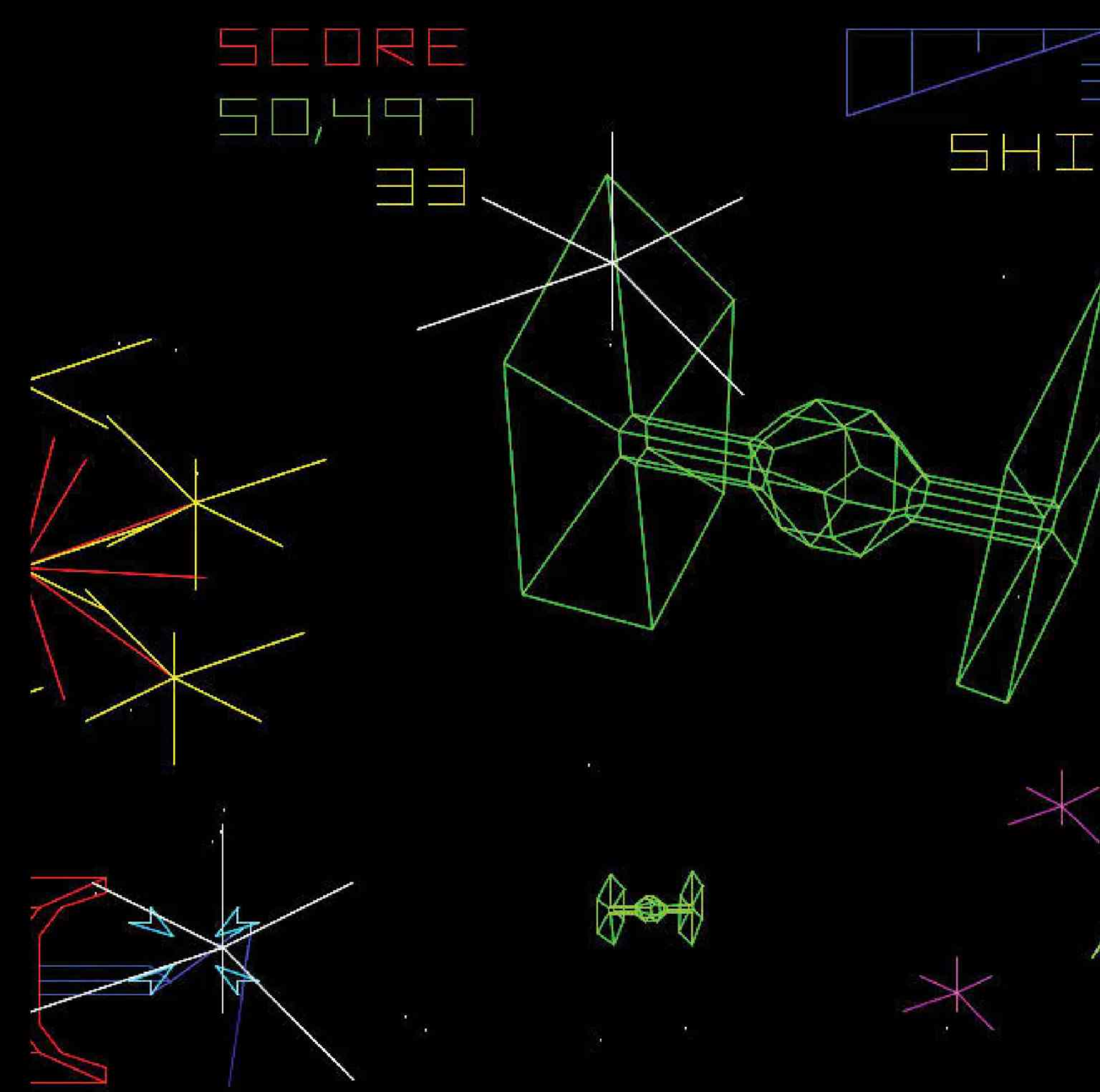
it was "a lot more than just a tarted-up *Pac-Man*." Joystiq's Jared Rea blogged: "A better name for it would have been *Pac-Man 2*, […] a name that gets the point across that *Pac-Man Championship Edition* is the first true sequel to the game since *Ms Pac-Man*."

Iwatani modestly suggests that some of the acclaim might be due to low expectations for a *Pac-Man* game, and says the response of game players exceeded his expectations, citing the many internet-based critiques that offered "splendidly glowing evaluations". (Happily, and despite claims to the contrary, Iwatani also assures us that *PMCE* is not necessarily to be his swansong, since he continues to be involved in videogame production. Although at this point in time (2015) he's yet to have been significantly involved in a new game in the way he was with PMCE. He's not left our thoughts completely however, as he made a cameo appearance alongside Pac-Man in Adam Sandler's recent movie *Pixels*.

With 30 years of experience in videogames design, including the most iconic games character of them all, Iwatani is now, perhaps suitably, involved in teaching aspects of videogames design to students at Tokyo Polytechnic University, along with conducting research into games for social purposes. Although *Pac-Man* has always remained popular throughout the years, we wondered what Iwatani made of the games industry's tendency towards over-complication and movie-like games, along with the relatively recent resurgence in retro-orientated titles. "We should carefully gauge the preferences of light users, who normally don't play videogames, and the preferences of videogame aficionados, and then design products to suit each," he suggests, thoughtfully. "A sumptuous party dress may be of limited practical value in daily living, and the same applies to over-elaborate videogames in the videogame market." On retro titles – 'pick up and play' games popularised by the internet, XBLA, Nintendo DS, Wii and iPhone – Iwatani thinks this might be a sign that the actual game, rather than aesthetics, is again becoming the main concern for developers: "Hardware specifications 20 or 30 years ago restricted powers of expression, and so the rules of the game were decisive in attracting users. The current boom in retro games is evidence of a universal fascination with game-playing itself."

We finish off the interview by returning to the subject of *Pac-Man*. We're keen to know how Iwatani feels to be the designer behind a game that almost everyone knows – one that perhaps only *Tetris* can challenge in terms of its incredible widespread appeal? "People view the work in different ways, from different viewpoints. Some see it as being broad and shallow. For others, it is narrow yet deep and praised," considers Iwatani. "What is gratifying about this is that people find such different reasons for loving it." And as a final word, Iwatani reckons that there are still things his 35-year-old creation can teach modern-day games designers, developers and publishers. "*Pac-Man* is the perfect videogame because its design gives top priority to the player and to a spirit of service," he says. "Its guiding principle is 'fun first'. This concept is in my view invincible and what I look for in the videogame creators of today, that they understand the importance of capturing people's hearts."




SCORE
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Star Wars

"YOU'RE ALL CLEAR KID"

» RETROREVIVAL

» ATARI INC
» ARCADE
» 1983

Like many adult males my age I'm a bit of a self-confessed *Star Wars* fan. It's not that I think they're exceptionally well made films – the masterful *Empire Strikes Back* excluded – it's just that they managed to connect with me in a way no other movie has since managed.

Playtime at school would be spent arguing over who got to play Han Solo (it was never me) walks home turned into inevitable re-inactions of key sequences from the trilogy, while my back garden was littered with toys.

Thank God then for the Atari release of *Star Wars* in 1983, as I was given a further output for all my Jedi-fuelled fantasies. Admittedly, this wasn't the first *Star Wars* videogame (that honour goes to the Atari 2600's plodding *The Empire Strikes Back*) but it was the first game to fully capture the joy of the *Star Wars* films, and I lapped it up.

Everything about it was perfect. The sit-down cabinet felt (with a lot of imagination) like you were strapped into your very own X-wing fighter, the controls were incredibly precise (although you may struggle a little with them nowadays) and the aesthetics were amazing. TIE fighters roared across the screen, fireballs hurtled towards you at frightening speeds and the dreaded Death Star loomed ever closer. Add in the wide variety of sound effects straight from the film and some of the best 'digitised speech' around and the end result was a truly magical experience that ate up your credits at a truly alarming rate.

What made *Star Wars* so great was the sheer amount of action that was going on. While the aerial dogfights with opposing TIE fighters were fun, it was the exhilarating race down the Death Star's trench that proved to be the game's real trump card. After reliving the movie so many times in the school playground, the ability to finally participate in the real thing (or as close to it as possible) was a revelation. Thank goodness we now have a stand-up cabinet in the office.

KUNG-FU MASTER

Kung-Fu Fighting – is it as fast as lightning? Originating in the late Sixties and then exploding throughout the Seventies, mainly thanks to the cinematic career of Bruce Lee, this martial arts phenomenon was firmly mainstream by the next decade. Graeme Mason takes a look back at the scrolling fighter that established a genre...

Like *Commando* (Ultimate Guide, Retro Gamer 138), *Kung-Fu Master* took its themes from contemporary and Seventies cinema. And in a sense, despite the disparity of methods, the genres of Kung-Fu and action were quite similar: one man versus an army, only instead of being tooled up with machine guns and other various weaponry, the hero uses nothing but his own fists, feet and cunning. No doubt influenced by the famous Bruce Lee flicks *Enter The Dragon* and *Game Of Death*, *Kung-Fu Master* also had the fortunate coincidence of being released in arcades just around the same time as the blockbuster cinematic hit, *The Karate Kid*.

Yet despite the relative high power of arcade games of the time, they all still needed that elusive element required of all videogames: playability, and *Kung-Fu Master* had more than enough of this 'X-factor' than you could shake a chopstick at. The game tells the tale of Thomas, the titular martial arts master; one day, while taking a pleasant afternoon stroll with his girlfriend, Silvia, Thomas is briefly distracted and several henchman appear and abduct his lover. Later, he finds a note stating that Silvia has been kidnapped by the mysterious crime boss, Mr. X, for reasons unknown. The sombre missive lays down a challenge, as if this is all simply a test for the hero. "If you want to save your dear Silvia's life," it reads ominously, "come to the devil's temple at once." Of course, a legion of henchmen and special bosses await Thomas, or as the note explains mysteriously: "Five sons of the devil will entertain you."

Kung-Fu Master was the idea of designer Takashi Nishiyama. Often credited in creating fellow classic arcade game, *Moon Patrol*, Nishiyama would go on to have a hand in another famous beat-'em-up, *Street Fighter*. For *Kung-Fu Master,* however, ▶

PIXEL PERFECT

Just a few of the things you'll meet in Kung-Fu Master

Silvia

Dragon

Poisonous Moth

Dragon Symbol

Dragon ball

Exploding Ball

Thug

Dwarf

Pot

Snake

Falling Vase

Knife Thrower

Trap Door

Thomas and Silvia

» Thomas's crouch kick was the only way to eliminate the dwarfs.

» A dragon's fiery breath deals loads of damage to poor Thomas.

▶ influenced heavily by the Bruce Lee movies mentioned earlier, Nishiyama devised a system where the lone hero would take on an incessant and varied band of villains, with the game (loosely) tied into a Jackie Chan film called *Spartan X*, or *Wheels On Meals* for western audiences. In the movie, Jackie plays one half of a pair of cousins running a fast food business. Both cousins are entranced by a girl named Sylvia who also happens to be a pickpocket. When Sylvia is kidnapped by a gang (because she's the heir to a large inheritance), the cousins and a private investigator all trot off to the villain's castle and punch and kick their way to Sylvia in the traditional style.

Kung-Fu Master was set apart from its peers by the scrolling, speed – there was to be no mass of moves (or blocking) – and considered tactical approach similar to Data East's *Karate Champ*. It was all about pace, and efficient, enemy-despatching strikes, with our hero required to counter an awkward time limit and a horde of evil henchmen. The game scrolled alternatively to the left and right as Thomas made his way up the temple, and at the end of each floor he came face to face with one of those despicable 'five sons of the devil'; kill the boss and it was up to the next floor. Lying in wait for Thomas were not only the five sons, but

» We sense a caveat coming up...

HOW TO PLAY

POISONOUS MOTHS

■ These lepidopterans appear on level four, swarming out from holes in the walls. Defeating them requires a different move depending on their position. It's better to rush past them; once they're behind Thomas they don't represent much of a threat.

DRAGON SMOKE

■ Level two quickly ramps up the difficulty, and about to form from this vertical column of smoke is a colourful dragon. The dragons breathe deadly fire at head height so it can easily be avoided. If Thomas is quick enough, he can rush past the static lizard, rendering it virtually harmless.

EXPLODING BALL

■ These piñata-style balls are as nefarious and deadly as they are colourful. They hover for a few seconds before unleashing three bolts: one directly down and one each side. If you get caught near one of these, duck just to the left or right of it and they should all pass Thomas harmlessly by.

FLYING KICK

■ Thomas' badass flying kick can take out multiple bad guys at once, the result of which is a sweet bonus. However, by the latter levels, Thomas takes too much time to land and recover his poise, meaning its best to utilise this move earlier on in the game where the enemies are much easier.

THUG HOLDS

■ The standard thugs don't pose much of a threat alone, but come level five you'll be cursing the faceless hoodlums. You are only able to escape from their grip by wiggling the joystick frantically left and right; the more grippers on Thomas, the quicker his energy falls.

KNIFE THROWERS

■ There's a little trick with the knife throwers: should one happen to be behind Thomas, it reduces the amount of enemies who mass in front of him. Try stringing the knife thrower along for as long as possible (avoiding his knives) and it can make progress much easier and quicker.

LONE THUG

■ The first level is a good time for Thomas to show off some of his skills. Its also a good time for you to get familiar with Thomas' moves. Try some punches and flying kicks for those all-important extra points; get three thugs in a row with a flying kick and earn a neat score bonus.

PUNCHING

■ Punching enemies earns a nifty double points bonus. But it's a considerable risk thanks to its incredibly limited range; careful timing is required for Thomas' fists of fury. However, utilising your punches is a useful variation for many of the boss fights.

PUNCHING KNIFE THROWER

■ The symbols on several pillars actually mark Thomas's progress through a level. Ordered from one to six, this one shows our hero is at stage four of the level and he celebrates by punching a knife-thrower in the face.

DWARVES

■ By level two the regular thugs and knife-throwers will be complemented with this, ahem, vertically-challenged type of villain. The standard kick and punch are out and you need to quickly learn how to duck, fight and walk in quick succession.

A KUNG-FU MASTER. THOMAS AND
SILVIA WERE SUDDENLY ATTACKED
BY SEVERAL UNKNOWN GUYS.
SILVIA WAS KIDNAPPED BY THEM.
© 1984 IREM CORP.
» *Kung-Fu Master*'s attract screens told the story of Silvia's kidnap.

knife-throwing villains, vicious dwarfs, killer dragons, exploding lanterns and poisonous moths. Thomas' mastery would be tested to breaking point. As well as the time limit, that made sure the player was unable to rack up points by lurking around on the easier levels, *Kung-Fu Master* also had a fun risk/reward mechanic. Thomas is able to perform flying kicks and punches in addition to his waist-high kick. He gets more points for these moves than with the standard kick, but there's a drawback: the punch doesn't have as much range, increasing the risk of one of the enemies grabbing Thomas and sapping his energy, while the flying kick is difficult to time and leaves the hero open to attack for a brief moment as he lands.

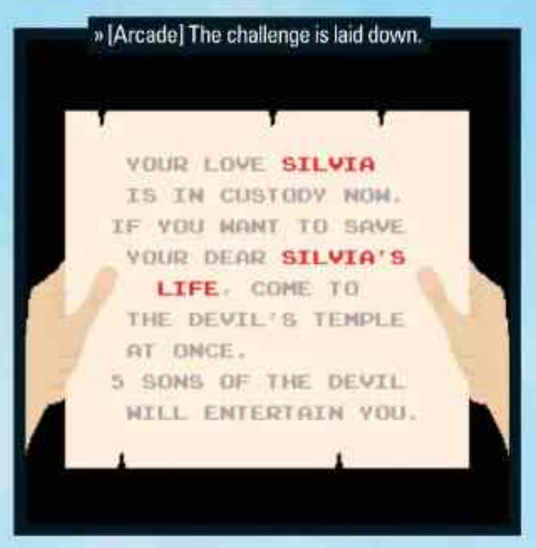
Kung-Fu Master was a well-loved title in arcades which made home conversions inevitable. It proved most popular on the Nintendo Famicom (NES) where it was released in Japan under the title of *Spartan X*, and became one of the biggest selling titles on the console in 1985. Irem licensed the Western conversions to Data East who in turn licensed the game to publishers such as US Gold for the European-based versions, while Activision published the game on the Atari 2600 and 7800. The conversions varied in quality with many home systems unable to handle the fast pace of the game, despite its relatively plain graphics. The main European versions from US Gold were particularly over-hyped, and, in the end, they disappointed many fighting fans.

"Kung-Fu Master was set apart from its peers by the scrolling and speed"

Somewhat strangely, *Kung-Fu Master* did not receive an official western sequel, although Irem's 1989 arcade hit, *Vigilante*, is regarded as a spiritual follow-up. *Spartan X 2* did appear on the Famicom in 1991, but it was no more than a retread of the first game, and the game shifted its plot to fall more in line with the Jackie Chan movie. Having transferred to Capcom to work on *Street Fighter*, Nishiyama moved to SNK where he is credited with creating more legendary beat-'em-up series such as the *Art Of Fighting* and *Fatal Fury*. Back at Irem, however, *Vigilante* ruled, as did Irem's renowned shooter, *R-Type*.

But today *Kung-Fu Master* remains not only a high-kicking playable game, but it can also can lay claim to several ground-breaking elements that influenced many future genre hits. Before *Kung-Fu Master*, fighting games were almost exclusively single-screen with the player facing a lone opponent, usually of similar ability and strength. Irem's hit introduced not only a scrolling environment, but also multiple weaker enemies that represented little threat individually, however, they were highly dangerous in groups or in a combination of types. Later games such as *Double Dragon* (1987) owe a debt to *Kung-Fu Master*, without Thomas there would have been no urban vigilantes, or those vengeful Lee brothers. In essence, few games can claim to have invented a genre such as *Kung-Fu Master* did with the brawler, a term coined for a game where one person fights against a seemingly-endless stream of enemies.

» At the end of each level awaits a flight of stairs to the next floor.



» [Arcade] The challenge is laid down.

» Having defeated Mr. X, Thomas is reunited temporarily with his love.

BOSS RUSH

How to defeat those five sons of the devil. Good luck, grasshopper

STICK FIGHTER

■ A tall and slim man, the boss at the end of level one wields a plain club which nevertheless can do significant damage to Thomas.

HOW TO BEAT: Back him into the stairs and alternate between the crouch and jump kicks while watching carefully for his attacks. Beware though: after you've beaten the game once, this boss will gain an extra 'middle' attack.

BOOMERANG FIGHTER

■ He may not be antipodean, but he is extremely handy with a boomerang or two, and damn, does that bloody thing sting when it hits you.

HOW TO BEAT: He will throw his boomerangs as soon as Thomas approaches, so these must be avoided. Then attack as quickly as possible, watching for the return journey of the deadly missiles.

GIANT

■ Literally a giant, this boss dominates the screen and his kicks can kill Thomas in very short order. This guy is a tough one.

HOW TO BEAT: Like Stick Fighter, it helps if you can back the giant against the stairs. Jump kicks are also useful as they do lots of damage and try to keep Thomas away from the giant's powerful kick.

BLACK MAGICIAN

■ Here at **Retro Gamer** we reserve special hatred for this guy. As a black magician, he throws fireballs and casts illusions to fool Thomas.

HOW TO BEAT: Thomas's main hip kick is out as it does no damage to the dark wizard. Try and back the magician up against the stairs and then use multiple crouch attack punches to dispose of him before he can cast too many fireballs.

MR. X

■ Here he is, Mr. X. He may not look like much but the gang boss is a skilled fighter and adept at blocking Thomas's attacks.

HOW TO BEAT: You need a lot of skill for this. Mr. X will block the majority of Thomas's attacks so the name of the game is persistence. Watch him closely; whatever move you can anticipate he is about to make, counter with the same attack.

CONVERSION CAPERS

There were numerous ports of Kung-Fu Master, which did you play?

ZX SPECTRUM

■ While it was always going to be a push converting the fast and scrolling arcade game, the Spectrum version was particularly disappointing to fans thanks to a turgid pace, choppy, ill-defined graphics and lousy collision detection. The sole plus point was the option to start the game on any level.

PC WINDOWS

■ As you might expect from a conversion to modern PCs, this version of *Kung-Fu Master*, like the other 17 arcade games featured on this compilation, is arcade perfect.

ATARI 7800

■ Now we're talking speed! Thomas fairly zips across each level in this version with hordes of gripper thugs converging on him, their arms stretched out like a bunch of zombified henchmen. Interestingly, the level one boss is almost a mirror image of Thomas himself, but nonetheless, this is one of the better home conversions.

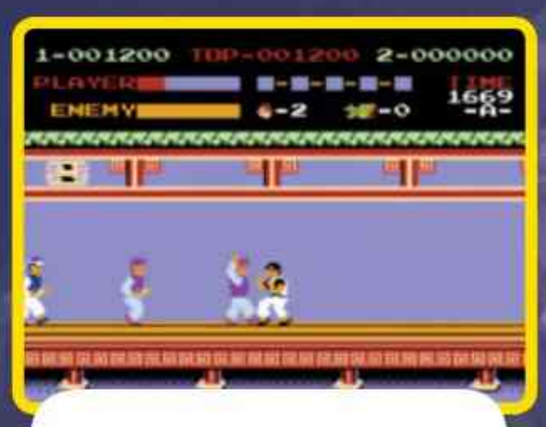
SATURN/ PLAYSTATION

■ In 1996, Irem released a small Japanese-only compilation entitled Irem Arcade Classics, which consisted of *Kung-Fu Master* and the distinctly less-than-classic *10-Yard Fight* and *Motorace USA*. As you'd expect from a format 13 years down the line, the conversions were nearly arcade perfect.

"[Kung-Fu Master] also can lay claim to several ground-breaking elements that influenced many genre hits over the years to come."

COMMODORE 64

■ Unsurprisingly, given its scrolling capabilities, the C64 conversion by US Gold copes well with the speed of *Kung-Fu Master*, in addition to an accurate rendition of the theme tunes and some suitably crunchy sound effects. And while the graphics are a little too much on the chunky side, the game is at least playable despite some control issues. And it has a really cool cheat: press the shift and G keys on level one, and Thomas gains a rather useful pistol he can blast enemies with!



NES

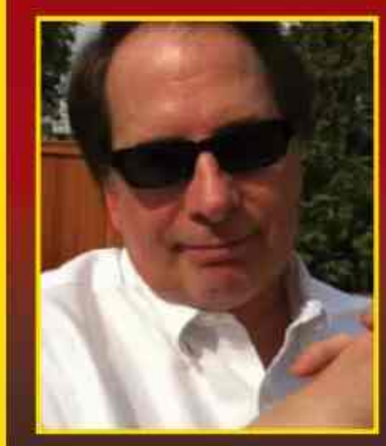
■ Another one of the great conversions of *Kung-Fu Master*. Other than a slightly squashed feel to the graphics, the game looks and feels very similar to the arcade original and even includes a good rendition of the in-game tunes. It's fast too, and no surprise it was such a good seller for Nintendo.

AMSTRAD CPC

■ While its colourful and decent graphics are marred by the Amstrad's squint-inducing scrolling, the CPC does well in emulating the pace of the original. Alas poor collision detection makes the game a bit too frustrating, although, in a rather cool move, Thomas gets to take an elevator instead of the stairs.

DAN KITCHEN

We chat to developer Dan Kitchen, the man responsible for squeezing Kung-Fu Master into the ancient Atari 2600



How did you get involved with *Kung-Fu Master*?
I was a senior designer at Activision and I had just finished the 2600 version of *Ghostbusters* when they secured the rights to the game.

What was your role?
I wrote the entire game myself including the audio and animations. I had a copy of the arcade machine in my office so that I could make the port as closely as possible on the 2600.

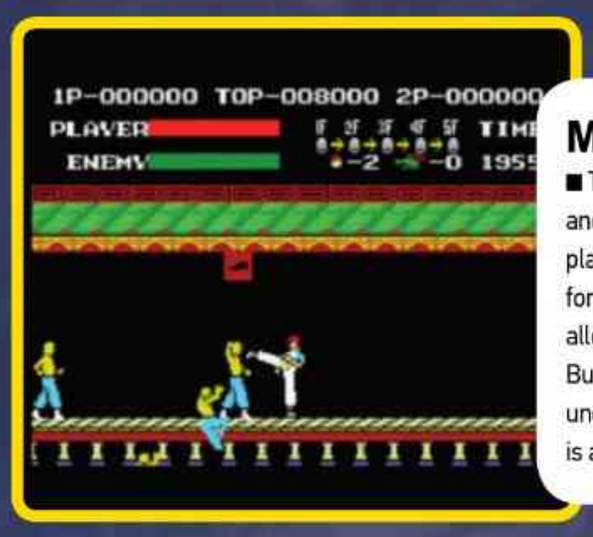
The game wasn't particularly complex even for an arcade game. But what compromises did you need to make?
I knew that I was unable to make the background as detailed as the arcade machine due to the limitations of the 2600, At Activision we always made the backgrounds scroll by single clock elements with players and missiles, basically, so they would scroll pretty smoothly. I also didn't have the extra player to add the falling lanterns.

And there was no jump kick...
Unfortunately I was unable to execute that kick as it appeared in the arcade machine due to the limitation of how wide I could stretch the main character using the 2600 player magnify and shift registers.

What about the controls?
I adapted them by using the joystick button and in conjunction with the joystick directions. By the time I did *Kung-Fu Master* I was an expert at the 2600 architecture.

How long did the game take and were you pleased with the end result?
The schedule was tough. I had to get the game done in less than 12 weeks, after doing exactly the same on *Ghostbusters*. But I understand it did about 40,000 units, so given the time and effort I was pleased with the result. I really enjoyed working on the 2600, so I look back fondly on the development of *Kung-Fu Master*.

Our thanks to Dan for his time.



MSX

■ The MSX version boasts colourful and well defined sprites, albeit against a plain black background. The hit detection for Thomas' attacks is a little looser, allowing for a more playable experience. But the main character trots slowly and unconvincingly, soon ensuring every level is a real chore. Close, but no chopsticks.

GAME BOY

■ Despite being an excellent game, the Game Boy version of *Kung-Fu Master* bears very little resemblance to its arcade forebear. Thomas is thrown into a number of urban environments and also can pick up energy and power bonuses. It's quite nice to play, if a touch on the easy side.

APPLE II

■ Devoid of any background whatsoever, the Apple II version is also almost soundless, save a couple of beepy tunes here and there. Gameplay is mixed; the speed is admirable, but some large snakes on level two make the section a huge chore.

ATARI 2600

■ An incredibly brave conversion and also a pretty commendable one considering the limitations of the hardware. There are naturally a host of graphical and gameplay compromises (see boxout interview with Dan Kitchen), but at least the game moves at a fair lick.

THE UNCONVERTED

Arcade games that never made it home

» Hitting multiple enemies with the bell is not only an effective tactic, but a high-scoring one. Each enemy is worth twice the points of the last, making combos worth trying.

» Attacking with the trailing bell requires planning – you're responding to enemy movements rather than directly assaulting them, and enemies can still evade when the bell is moving.

» Returning characters from previous games have received a makeover for their appearance in *Tinkle Pit*, but retain their old abilities – these Pookas from *Dig Dug* can travel through walls.

» When a whole cake is collected, this slice will grow into a whole cake and a new slice will spawn. Growing your items is an important step to achieving high scores.

TINKLE PIT

■ **Developer:** Namco ■ **Year:** 1993 ■ **Genre:** Maze Game

■ If you ever need reminding that the arcade market of the early Nineties was a weird, transitional scene, *Tinkle Pit* should serve well. Despite the declining popularity of traditional maze games and the market's preference for the 3D games which were finally beginning to come of age, Namco chose to release *Tinkle Pit* into arcades in 1993. That's the same year it released *Ridge Racer*. But while it's true that *Tinkle Pit* is something of an anachronism, it plays rather well.

You play as a young blonde chap, who happens to be accompanied by an anthropomorphic sleigh bell. He's promptly plonked into a maze to fight all manner of enemies, including familiar Namco characters drawn from games such as *Toy Pop* and *Dig Dug*. The main way to defeat enemies is with the bell. Pressing a button fixes its position, allowing your hero to run around the maze while leaving a trail of string behind. When the button is released, the bell will follow the trail back to your position, knocking out any enemies it encounters along the way. You can also collect yellow energy balls which are thrown forward and bounce around the maze, but these are single-use and can only defeat one enemy at a time. Stages are cleared by eliminating every enemy. Every few stages, a boss will appear which takes multiple hits to defeat.

Tinkle Pit manages to keep things interesting, with good scoring mechanics largely responsible for this. Greater scores are awarded for knocking out multiple enemies with the bell, encouraging you to leave longer trails. However, long trails allow enemies more time to leave the bell's path. Additionally, each stage contains pick-ups which award more points. These come in small and large varieties, and you're encouraged to pick up large items to allow small ones to grow. Pick up all eight large items and you'll get a major bonus.

There's a lot to like about *Tinkle Pit* and Namco fans will enjoy spotting all the returning characters – there's even a power-up which turns you into *Pac-Man*. However, thanks to its Japan-only release and the general decline of maze games as a genre, it's easy to see why *Tinkle Pit* didn't receive any conversions.

CONVERTED ALTERNATIVE

PENGO 1982

Sega's block-kicking penguin has appeared on a variety of formats since his debut, including the Atari 2600, Commodore 64 and Game Gear. However we're big fans of the 1995 Mega Drive remake which features new mechanics and a multiplayer mode, as well as an excellent conversion of the original arcade game.

ARBALESTER

■ **Developer:** Seta ■ **Year:** 1989 ■ **Genre:** Shoot-'em-up

» A relatively unremarkable shoot-'em-up, but *Arbalester* includes some impressively large enemies.

■ **If you're not well versed in medieval weaponry, that title might seem a bit strange to you.** An arbalest is a crossbow variant, which is of course perfect for a game about fighter planes. *Arbalester* is a rather traditional shoot-'em-up in the same vein as the likes of 1942 – no bullet hell here. As well as shooting forward, your plane bombs ground-level targets by default, and comes equipped with an exchangeable secondary weapon that can send miniature planes or massive flying fortresses at the enemy.

Visually the game takes an age to get going, with very little variation in the sea backgrounds of the early stages, though it does pick up a little later on with the inclusion of cloudscapes and forests. Much better are the gigantic bosses on offer, but these are sadly few and far between. *Arbalester* is a largely unremarkable shooter, with little to distinguish it from the more accomplished competition that had arisen in the late Eighties. This likely put paid to its chances of a NES release back then, but paradoxically increases the appeal of the game today – it has the simplicity of a mid-Eighties shoot-'em-up but feels fresher due to a lack of familiarity.

CONVERTED ALTERNATIVE

1943: THE BATTLE OF MIDWAY 1987

Capcom's shoot-'em-up also has a realistic theme, but as the sequel to the popular *1942* it received a number of home conversions, appearing on the major home micros as well as the NES and PC Engine. Arcade-perfect versions later appeared on *Capcom Classics Collection Volume 1* for PlayStation 2 and Xbox.

CONVERTED ALTERNATIVE

NBA JAM 1993

After blowing the arcade sports genre wide open, it was inevitable that *NBA Jam* would make the trip to home consoles, and it eventually arrived on the Mega Drive, Mega-CD, Game Gear, Game Boy and SNES. It happens to be a fair bit better than *Rim Rockin' Basketball*, too.

RIM ROCKIN' BASKETBALL

■ **Developer:** Incredible Technologies ■ **Year:** 1991 ■ **Genre:** Sports

■ ***Rim Rockin' Basketball* is a strange release.** Struggling forth on noticeably dated hardware, the game offered a more serious take on basketball than the likes of Midway's *Arch Rivals*. The game switches perspective as the ball is turned over to the opposing team and players are limited to simple shots and passes. Certain fouls are included and the occasional graphical touch such as a shattering backboard enlivens proceedings, but overall this is not spectacular work.

The game's major saving grace is its multiplayer, as up to four players are supported by the cabinet. However, there's a major downside to this – a full game will last the best part of an hour as the game counts down its quarters in real time, but credits only last for a fraction of a quarter. As a result, playing a full game of *Rim Rockin' Basketball* is ridiculously expensive, especially when multiple players are involved. Games from Incredible Technologies never received home conversions, explaining the failure of *Rim Rockin' Basketball* to make it to consoles.

» The attacking team is always running upwards, as the viewpoint changes at each turnover.

BEST LEFT IN THE ARCADE
MIRAI NINJA

■ **Developer:** Namco ■ **Year:** 1989 ■ **Genre:** Run-and-gun

■ **Licensed from a film of the same name, *Mirai Ninja* is a run-and-gun game that was exclusive to Japanese arcades.** The basic premise isn't too different from games such as *The Legend Of Kage*, with a seemingly limitless supply of ninjas zapping in to provide shuriken-fodder. The game doesn't look too bad, with nice stylistic touches like a life indicator written in kanji, and it contains some rather neat sections with massive rotating sprites that admittedly look very impressive. Unfortunately, that's where the praise ends.

Stage design in *Mirai Ninja* is incredibly dull, with flat layouts that barely differentiate themselves from one another. Enemy design is similarly bland, with few foes providing any real challenge – even the bosses are pushovers. Worse yet, power-ups are limited to a screen-clearing smart bomb and a triple shot. It feels extraordinarily dated, bearing in mind that ninja games such as *Strider* and *The Revenge Of Shinobi* appeared in the same year. If licensing was the factor that prevented this from making a home appearance, we should be grateful.

» This screenshot actually looks pretty interesting, which gives a rather misleading impression of *Mirai Ninja*. Sorry, readers.

THE LEGACY OF ROBOTRON

"The human race is inefficient and therefore must be destroyed." Ten words that kicked off the cult of Robotron. Along with some of the new wave of game designers who helped revitalise the twin-stick shooter for the modern age, Mike Bevan explores the enduring appeal of Eugene Jarvis and Larry DeMar's arcade masterpiece

ROBO LOVE

JOHN ROMERO (DOOM)

"At the start of the Eighties, back when arcades ruled supreme, games were *fast*. Quarters went into these games *fast*. It was a real challenge to be able to play an arcade game past five minutes on one quarter. And the games were made for quick reflexes and fast thinking. Of all the games that ruled the arcades, *Robotron* was the most manic, complex and pulse-pounding experience that anyone had encountered. Two joysticks, moving and firing in any of eight directions independently, assumed that anyone good at the game was a real master. Eugene Jarvis had created the ultimate arcade game."

Robotron. Its very name can send even the most battle-hardened arcade fan into a volley of nervous spasms and involuntary muscle twitches. An unrelenting barrage of digital cybernetic hostility in a single black screen, this savage blaster chewed up players and their coinage as if there was no tomorrow, which was rather apt considering the game's apocalyptic storyline. Yet despite its unyielding nature, *Robotron* remains highly regarded among retro gamers and developers alike, something that's evident from **RG**'s Desert Island Disks feature over the years – it's still the foremost requested game among our castaway list of veteran designers.

Created by Eugene Jarvis and Larry DeMar, *Robotron* was the third videogame the pair designed for Williams Electronics, following the equally well-received pairing of *Defender* and *Stargate*. It's a nightmarishly dystopian vision, as the encircling robotic horde hunts the last surviving human family, seeking the rapid demise of our goggle-eyed hero. "The game was inspired by a number of influences," recalls Eugene. "First off, I loved Al McNeil's robot killer game *Berzerk*. The great sounds and primal kill-or-be-killed action were a huge rush. But I became frustrated by the single-joystick control. I wanted to make a game with significantly more firepower. I was also inspired by the early Commodore PET game *Chase*, which used 24x80 line text-based graphics, where the player tried to run away from enemies while luring them into a minefield to their death. Throw in elements from *Defender* and *Pac-Man* and you've got a lot of the gameplay.

"We started with the game engine from *Defender*/*Stargate*. I concentrated on the character/projectile behaviour, level design and game mechanic, while Larry basically did everything else, including all the mind-blowing special effects. To move the pixels, Larry and I specced out what we called the *Robotron* graphics DMA chip, which may have been the first graphics co-processor for a colour bitmapped system capable of rendering arbitrary-sized programmable 2D images. The DMA chip made possible all the amazing explosion and particle effects in the game, as well as powering the gluttonous pixel rate."

Notwithstanding the game's splendid presentation and masterful use of colour and sound, it's the now-familiar twin-joystick control system that's *Robotron*'s crowning glory. With the first stick to move the player character and a second to guide an unending stream of bullets, it's far easier to get to grips with than *Defender*'s complex controls. *Robotron* wasn't the first videogame to use it, but it was arguably the first shooter that needed dual-stick controls as a conscious design choice. So was there a 'eureka!' moment when Eugene wired up that second stick for the first time?

"Totally," Eugene grins. "I started with one-joystick control, where you would just try to lure the robots into electrodes like the *Chase* game. And it was fun – for about five seconds. Then I realised you have to kill shit. Once I wired up the second 2600 stick for firing and screwed it to the control panel, I knew I was on the right track." Eugene's experience as a sound engineer on Williams' pinball games came in handy at this point. "I used the old ball-lock sound with echo decay from *Firepower* for firing, and I threw in a *Defender* explosion for a robot hit, and I started feeling the tension and release. Then when I dialled up the robot count to 128, the adrenal cortex overload was complete. Within moments, I was a sweating, gasping mass of smoking neurons…"

The fact that *Robotron*'s action takes place in a claustrophobic single-screen arena sets it apart from the pair's previous games, and helps ramp up the tension to coronary-inducing levels. "Where the cool thing about *Defender* was the freedom to fly beyond the single-screen space into an entire planetary world, *Robotron* was all about the tension of confinement," Eugene muses. "There was no escape from the confrontation, no fight or flight, only fight or fight."

One small ray of hope among the overall nihilism of the game is the ability to save members of the last human family: Mommy, Daddy and little Mikey. Quick reflexes can save them from electrification by Hulks or reprogramming by roaming Progs into cybernetic zombies. "This 'family' has direct parallels with the *Defender* astronauts," says Eugene. "I felt strongly that a game has to be about more than just killing – first from a play mechanic perspective. If everything is just a shoot-kill then the game gets old and stale quick. Spicing it up with a rescue dynamic enriched the game and added a lot of variety to play."

As for the game's renowned difficulty, Eugene is unrepentant, revealing that it could have been even more evil. "In the Eighties, the arcade scene was dominated by hardcore

ROBO LOVE

MARK TURMELL (SMASH TV)

"*Robotron* is the greatest game of all time. It's why I joined Williams/Bally/Midway and created *Smash TV*. I went there to revive the dual-joystick mechanic. Eugene is still a good friend of mine, and I learned many lessons from him that I use to this day."

players, the type that would be playing *Call Of Duty* and other FPS games today," he reflects. "*Robotron* actually went out even harder at first, but it was just too brutal. The controls required independent motion of both hands, which was very new, and even today many players can't walk and chew gum at the same time. We had to lighten up the game."

We can only imagine what sort of state our wrists and synapses would have been in if he hadn't. Interestingly, it seems that if you were left-handed, you might have had a small advantage. "Observing cigarette burns on control panels, I could tell that *Robotron* had about a 50/50 mix of right- and left-handed players, which is very unusual since lefties make up only 10-15 per cent of the population," he remarks. "Because lefties have to adapt to a right-handed world, they are more ambidextrous than righties. Hence they make better *Robotron* players!"

Welcome to the Pleasure Dome

"When *Robotron* came out, I felt that the twin-stick control would rapidly dominate the industry," Eugene reveals. "But surprisingly few titles came out – probably due to the hardcore nature of the interface and the rising dominance of casual players. A big problem was the standard single joystick or joypad in consoles such as NES and Atari 2600. The ubiquitous single-stick paradigm effectively locked the twin-stick genre out of the consumer space. Most of the ports suffered from lack of dual joysticks, hardware performance, or if there were two joysticks, how do you nail them down to the coffee table?"

The hardware issue plagued many of the official home ports of *Robotron*, although some third-party efforts, such as Paul Holmes' Spectrum homage *Wild West Hero*, went some way to capturing the spirit of the arcade original. Even Eugene and Larry's sequel to the game, *Blaster*, abandoned the twin-stick model, and, despite flourishes of brilliance, was something of a flop. "*Blaster* is fun, but it failed to resonate with players for a few reasons, including the videogame crash and a tiring of space themes," Eugene admits. "We faced the problem all 3D flight games have suffered for many years. The action is very compelling and exciting on a primitive visual level, but it is hard to get meaningful gameplay and interaction as you blow through the universe at the speed of light. Repeat play becomes a huge issue."

One arcade game directly influenced by *Robotron* was Atari's excellent vector shoot-'em-up, *Black Widow*, as its creator, Bruce Merritt, explains: "We had a *Robotron* game in Atari engineering's common area and many of us had calluses from wrenching the joysticks, shooting brains and protecting our nuclear family. It was definitely inspirational in the use of controls in *Black Widow* – it was hard to argue how effective two sticks were in escaping in one direction while firing in another."

By 1990, arcade videogame hardware had evolved enough to tempt Eugene to return to the twin-stick shooter genre, with Mark Turmell and artist John Tobias. "The original concept for *Robotron* was really more in line with a huge multi-chamber world like *Smash TV*," he says, referring to his famously violent gameshow-themed shooter. "In arcade [design], the rule was ship the game when it becomes fun, and with *Robotron* a simple random-number-driven world generator did the trick, obviating the need for a hugely detailed world. So Mark, John and I wanted to go back and do this huge world culminating in the fabled 'Pleasure Domes'. Also, we were really jazzed to develop a new storyline based on *Running Man* and *RoboCop* memes."

The final instalment in Eugene's unofficial *Robotron* trilogy, 1993's *Total Carnage*, featured a distinctly Gulf War-inspired atmosphere, and ditched most of the static arena 'lock-ins' of *Smash TV*, something that Eugene admits may have been a mistake in terms of player excitement levels. "For *Total Carnage*, we tried a scrolling mechanic, and the game really lost something," he admits. "It became just a fire-hose kind of shooter without the tension."

Outside of Eugene's own inventions, there were a few other interesting takes on the format, including Jeff Minter's surreal but brilliant homage, *Llamatron*, which was released as a shareware title for the Atari ST and Amiga. Midway's *Robotron X*, released in 1996 on the PlayStation and PC, and later ported to the N64, brought the original game up to date in 3D, with varying success depending on how well players were able to utilise the 3D camera.

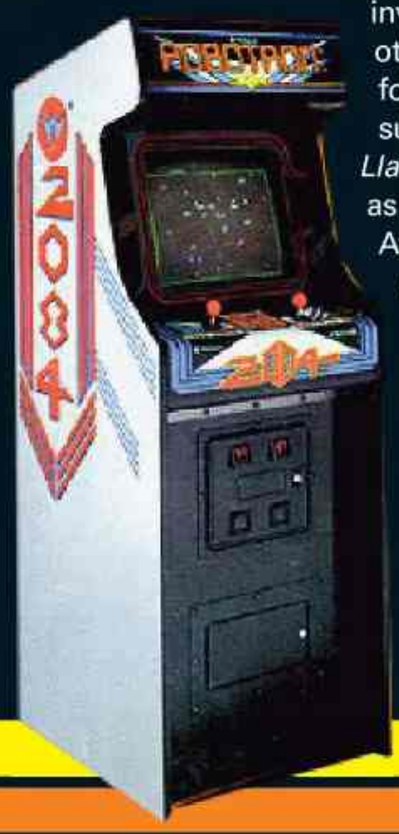
ROBOTRON: 2084
BEWARE OF THE INGENIOUS
BRAIN ROBOTRONS THAT POSSESS
THE POWER TO REPROGRAM
HUMANS INTO SINISTER PRO
BRAIN - 500 CRUISE MISSILE - 2

ROBO LOVE

TIM SKELLY (STAR CASTLE)

"*Robotron* was hugely groundbreaking. In fact, I named my book of videogame cartoons after it: *Shoot The Robot, Then Shoot Mom!*. I overheard a kid giving tips to a friend, and I just had to use it as my book title..."

» The utterly beautiful *Geometry Wars* franchise is arguably the most popular *Robotron* clone of recent times.



EUGENIUS!

The ten best games of Eugene Jarvis... aside from Robotron

01 DEFENDER

Defender's stark beauty, multi-dimensional gameplay and stunning pyrotechnics were a revelation back in 1980, more surprisingly given that it was Eugene's videogame debut. It revitalised the fortunes of manufacturer Williams to such an extent that Stan Jarocki, marketing head at arch-rival Midway, was heard to comment: "For a first effort, *Defender* is amazing."

08 CRUIS'N USA

The first in Eugene's much-admired driving series, *Cruis'n USA* was a lighthearted take on the arcade racer, with a physics engine that favoured spectacular spins, crashes and airborne vehicles over realism. The game's visuals, which were painstakingly digitised from real-life locations, are a real asset in bringing the various courses from around the US to life.

02 FIREPOWER

This highly regarded pinball table from legendary designer Steve Ritchie was the first electronic pinball machine to feature now-standard elements like 'lane change' and multi-ball. Eugene was responsible for the game's software and memorable sound effects, while the table's classic layout went on to inspire the hit video pinball simulation, *David's Midnight Magic*.

09 BLASTER

Vid Kidz' last videogame, this unofficial *Robotron* follow-up is a fast-paced 3D space shooter. Despite negative comparisons to *Robotron*, *Blaster* is a great bit of programming; its psychedelic Lego-brick visuals convey a real sense of speed. The game's rarity and heritage has made it popular with collectors, with the attractive Duramold cabinet being particularly sought after.

06 SMASH TV

Eugene's triumphant return to the twin-stick shooter, *Smash TV* is an ultra-violent gameshow-themed blaster where big guns, rather than points, mean prizes. Building on *Robotron*, it adds an exploration element, a variety of funky weapons, and some particularly gnarly bosses, including the infamous Mutoid Man. Winning a brand new VCR was never so much fun.

09 CRUIS'N WORLD

Racing games were big business in the Nineties, so it was inevitable that Eugene would be asked to produce another. This time there's a globe-trotting theme and a new stunt system. After one last sequel, 1999's *Cruis'n Exotica*, the series became the highest-grossing arcade racing franchise of all time.

03 STARGATE

With *Defender*'s massive success under their belt, Eugene and Larry left Williams to form their own company, Vid Kidz. *Stargate*, the sequel to their debut hit, was the first project under this new moniker. It features similarly blistering gameplay, adding new enemies and features, like the Stargate itself, which served as a portal to nearby humanoids in distress.

05 NARC

This controversial scrolling shooter was one of the first games to use the digitised graphics technique later made famous by *Mortal Kombat*. *Narc*'s body count would make Arnie blush – blowing the appendages off drug lords with Uzis and rocket launchers is entertainingly silly, although pacifists can go for the less lethal approach of arresting suspects for bonus points.

07 TOTAL CARNAGE

The final slice of twin-stick mayhem from Eugene and Mark Turmell, *Total Carnage* takes place in a fictional Middle Eastern state where a crazed dictator is in cahoots with evil space aliens. Despite some clever ideas, it doesn't scale the lofty heights of its predecessors, but is still an enjoyable romp.

10 THE FAST AND THE FURIOUS

Licensed from the popular 2001 street-racing flick, this arcade racer is very much the spiritual successor to the *Cruis'n* series. *The Fast And The Furious* lives up to the name of Eugene's production company, Raw Thrills, providing a high-octane rush through a variety of well-known US locales.

"*Llamatron* was a very cool and humorous take-off," says Eugene, praising Minter's take on his game. "But like almost all the classic arcade titles, the 3D thing just never worked out for *Robotron.* The 2D complete information God's-eye view is what makes the game happen. Getting whacked in the back or blindsided in a 3D world will never be fun. You really need the complete info of 2D to be able to handle the central nervous system overload *Robotron* is known for."

ROBO LOVE

JEFF MINTER (LLAMATRON)

"Eugene Jarvis was my absolute hero back then, and his designs had a major influence on my own style. My favourite was without doubt *Robotron.* This superlative game was presented in what was the signature style of Jarvis and Larry DeMar – fast action, large numbers of brightly coloured enemies, and wonderful explosions that shattered the enemies into tiny pieces all over the screen when shot. A twin-stick control system allowed you to move and fire with great precision and accuracy – an absolute necessity in a game that was brutally, beautifully, *sensually* difficult."

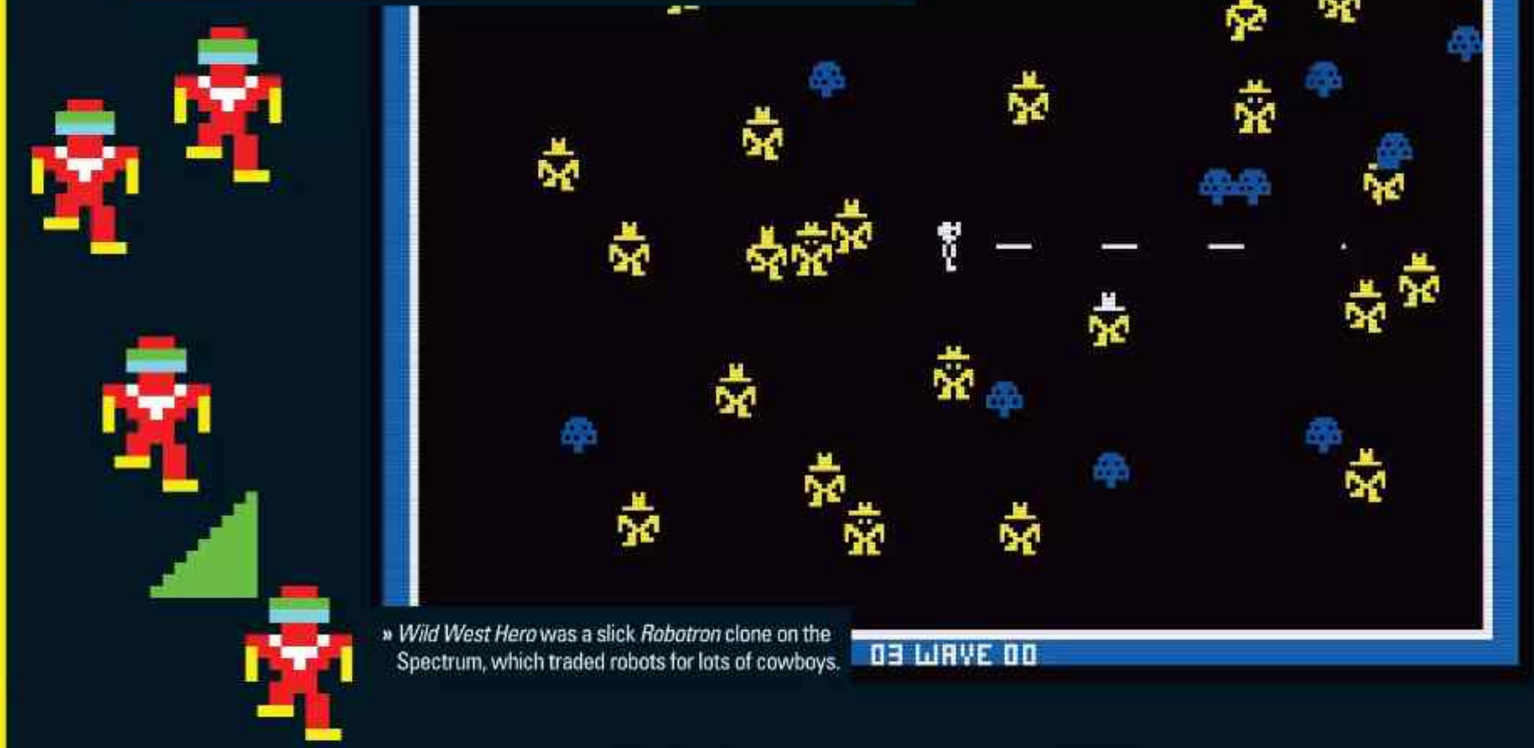
The twin-stick revival

Ironically, it was one of the banes of a retro gaming fan's life that turned out to be the saviour of twin-stick shooting games – the rise of the first-person shooter. "It wasn't until the dominance of FPS games drove dual-stick adoption in the Xbox and PlayStation DualShock controllers that the twin-stick approach became standard, almost 20 years after *Robotron*," says Eugene. "Next, the rise of retro players and the indie development community on Xbox Live Arcade created the current twin-stick game renaissance in its original 2D form."

One of the first, and arguably most influential, of the new wave of twin-stick shooters was Bizarre Creations' *Geometry Wars,* originally included as an Easter egg in *Project Gotham Racing 2.* "When I started at Bizarre, I ended up working on *PGR1*, being given most of the tasks the more senior coders couldn't be arsed to do," says designer Stephen Cakebread. "One task happened to be the code that interfaced with the Xbox joypad, so one evening while prototyping some code that dealt with the two analogue sticks I got a little bored, and because I was aware of the idea of the twin-stick shooting mechanic, and already had some code reading both sticks, it felt natural to experiment making a twin-stick shooter.

"One of the big differences in play that I noticed was the importance of position in *Robotron*, due to the eight-way shooting, whereas position in the first *Geometry Wars* is fairly unimportant – mostly you just circle forever. This added an extra layer to the gameplay in *Robotron*, so I wanted to replicate that feeling in the later *GW* games, but without limiting fire direction. So its influence on *Geometry Wars* is that it made me aware that you can make a fairly tactical game even when it's very chaotic, and prompted me to work on the gameplay to increase the number of decisions the player had to make. *Robotron*'s design is excellent, and anyone making a modern twin-stick shooter should definitely play it, as it has a lot to teach."

"My first experience of a game of that type would have been *Llamatron* on the Atari ST," says indie developer Charlie Knight. "I think I must have discovered *Robotron* after playing that. *Robotron*'s a really pure game, and I think that's a lot of the reason it's so well regarded. I'd say I got more from *Llamatron* on account of it being much less punishing, but it lacks *Robotron*'s punch and immediateness. I can't think of many other games that come close to it in this sense. In terms of



» *Wild West Hero* was a slick *Robotron* clone on the Spectrum, which traded robots for lots of cowboys.

FANCY A CHALLENGE?

Eight rock-hard arcade games

01

DONKEY KONG

The King Of Kong goes to great lengths to convince us that *Donkey Kong* is the hardest arcade game. We haven't played everything to compare, but we'd guess it was pretty close, given the notorious Elevator stage, in which Donkey Kong bounces lethal springs across the screen at breakneck speed.

02

SINISTAR

Sinistar is notable for being modified to be far harder than originally intended, after dollar-hungry arcade operators complained that players were lasting longer than two minutes. It also features perhaps the most terrifying videogame boss of its era, the eponymous Sinistar. "Run, coward," indeed.

03

TEMPEST

Dave Theurer's abstract vector shooter brought a nightmare into the arcades, being inspired by a childhood dream of monsters pouring out of a hole in the ground. Like *Robotron*, *Tempest* is a wonderfully pure blaster, testing players' nerves before completely and utterly overwhelming.

04

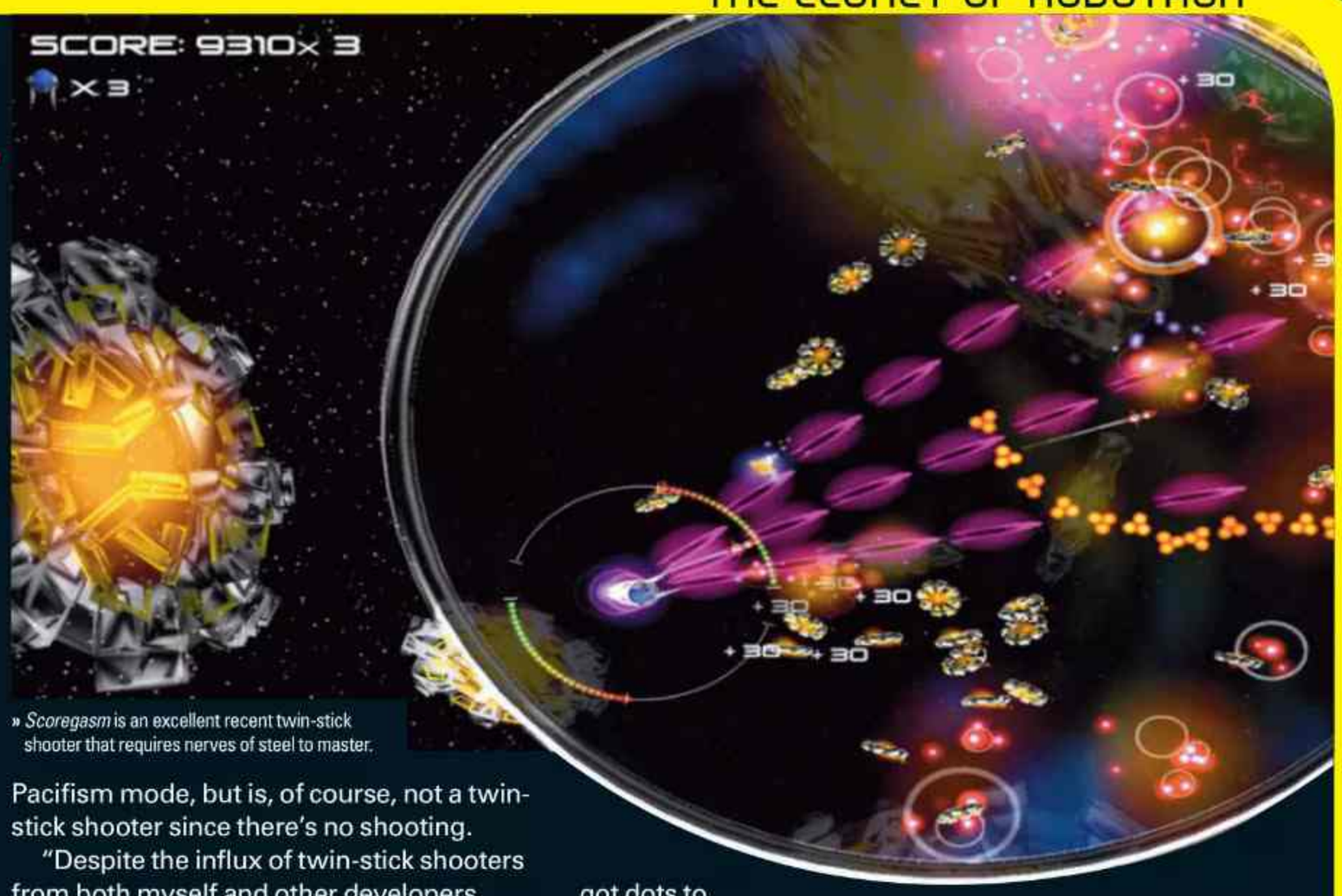
SUPER ZAXXON

For some reason, Sega saw fit to make the sequel to its hit isometric shooter scroll at roughly twice the speed, making slamming into a wall or missile less a threat, more a foregone conclusion. The claustrophobic tunnel sections only serve to make things even trickier. Suffice to say it wasn't nearly as popular with arcade goers as the original.

it being an influence, it's the essence of every twin-stick that followed, and my own are no exception. *Bullet Candy*, my first commercial game, started life as a fairly dull clone before I realised that it'd be more fun to put my own spin on it. More recently, with *Scoregasm*, I guess in terms of the game's structure and pacing the influence is more diluted, but the essence is still there for all to see."

"I was a huge *Robotron* fan, but was hugely let down by the Genesis version," says Radiangames' Luke Schneider. "Without the dual joysticks of the arcade version, the immediate and visceral connection to the action was severed. I picked up a PlayStation with a DualShock for *Metal Gear Solid*, and its real influence on me was instilling a strong desire to create a dual-stick shooter. Trying to replicate *Robotron* on dual-analogue sticks isn't wise, though, because the eight-way directionality is so important to the design, and analogue sticks aren't eight-way.

"When I started Radiangames, my first game had to be a twin-stick shooter. *JoyJoy* was released in 2010. Since then, I released two other twin-stick-influenced games, *Inferno* and *Ballistic*, with enhanced ports of those two titles. And then there's *Fireball*, which was directly influenced by twin-stick legend *Geometry Wars 2*'s Pacifism mode, but is, of course, not a twin-stick shooter since there's no shooting.



» *Scoregasm* is an excellent recent twin-stick shooter that requires nerves of steel to master.

"Despite the influx of twin-stick shooters from both myself and other developers, there's still a couple of unique things about *Robotron*'s design that still makes playing the arcade version special today: the eight-way directional focus and the 'everything spawns in at once' wave design. Those elements combine with the authentic 8-bit era sound effects and graphics to create a game that will remain a classic forever."

Developer Puppygames is unleashing a whole trilogy of *Robo*-influenced twin-stick shooters, starting with *Ultratron* for the Xbox 360 and PC. "*Ultratron* was a very traditional eight-way movement, eight-way shooting, *Robotron*-esque game," says coder Caspian Prince. "*Ultratron 2* added the now-ubiquitous mouse-to-aim controls. For *Ultratron 3*, we're throwing in a bunch of old arcade memes in order to liven it up somewhat. We've got dots to gobble, which earn money to spend on upgrades. We've got pets that you buy in the shop between levels, which follow you around and help zap the enemies in one of three distinctive ways. And lastly we're un-evolving the level spawning away from the *Ultratron 2* style of constantly spawning enemies, making it more like contemporary titles such as *Mutant Storm*."

With the current resurgence of games utilising the dual-stick mechanic, from *Super Stardust Delta* to *Lara Croft And The Guardian Of Light* and *Minotron*, and dozens of quality PSN, Xbox Live Arcade, Xbox Live Indie and iOS titles to choose from, there's never been a better time to celebrate the twin-stick shooter. "I love that developers today are inspired by classic titles like *Robotron* and *Smash TV*," says Eugene proudly, "and new-generation hits like *Geometry Wars* have pushed the dual-stick shooter genre to new frontiers of fun..."

ROBO LOVE

STEVE WOITA (QUADRUN)

"While I was at Atari, I would take breaks that involved walking to the very back of the building, which had a small arcade that included many classics, one of which was *Robotron*. I found that this was the only videogame that I actually got exercise playing, and I always felt great afterwards. The bonus chain design was awesome and had a pinball scoring way about it – the first collection was 1,000, then 2,000, 3,000, 4,000 and 5,000 points thereafter. If you died or ended the wave, it would reset to 1,000 points for your next pickup. This design element was brilliant. It was just magic."

05

FLYING SHARK

Modern shooters are designed so nearby enemies won't fire on you, giving players a sort of survival buffer. Toaplan's early shoot-'em-ups, which also include *Twin Cobra* and *Truxton*, feature baddies that have a habit of firing mercilessly, even if they're right on top of you. The result? Much cursing, angry clattering of joysticks and very little change left in our pockets.

06

JOUST 2

Joust 2 was a victim of circumstance, being designed as a kit conversion for arcade cabinets with vertical monitors, the most common at the time because of the ubiquity of *Pac-Man*. While the original used a horizontal screen, giving you plenty of warning of incoming enemy buzzard attacks, the sequel's restrictive field of vision made for a far tougher game.

07

R-TYPE

The *R-Type* games, alongside Konami's *Gradius* titles, are renowned as some of the most punishing shoot-'em-ups ever created, requiring superlative reflexes and the memorising of large chunks of their level layouts to even have a remote chance of seeing them through. *R-Type*'s famous mothership is not for the faint-hearted, and the rest of the game is harder still.

08

GHOSTS 'N' GOBLINS

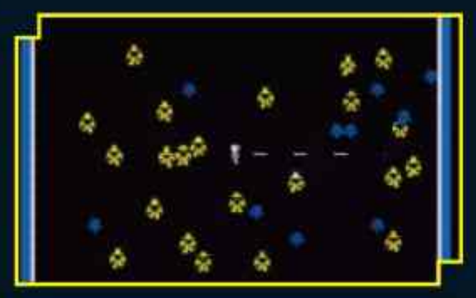
The *Ghosts 'N' Goblins* series as a whole is notably difficult, but the original is probably the hardest of the lot – even the opening stage requires pixel-perfect timing and a high degree of skill just to make it to the first boss. Adding insult to injury was the fact that Capcom made you play through the game twice to reach the true ending and rescue your sweetheart.

ROBO EVOLUTION

20 games with a debt to Eugene Jarvis's classic blaster

BLACK WIDOW

With a twin-stick control scheme hijacked from *Robotron*, Bruce Merrit's underrated vector-graphic blaster tasks players with keeping a series of webs clear of marauding enemy bugs. *Black Widow* is fast, fluid and compelling, and as with *Robotron*, it's a game that ideally requires playing on an original arcade cabinet to fully appreciate its genius.



WILD WEST HERO

Along with the authorised conversions, a number of third-party clones made their way onto home computers in the Eighties. Paul Holmes' *Wild West Hero*, released on the ZX Spectrum, was one of the finest. Atarisoft obviously thought so too, signing up Paul for the official Spectrum *Robotron* port, which sadly never materialised.

SLIMEY'S MINE

Simon Pick's quirky C64 shooter, a sort of cross between *Robotron* and *Pac-Man*, sees our frog-like hero zipping around caverns, zapping nasties and collecting jewels. It's extremely good fun, doubly so because of its hilarious sampled sound effects, with baddies that emit gurgling screams on dying, accompanied by shouts of, "Got him!"

CRYSTAL QUEST

The first game to support full colour on the Mac, *Crystal Quest* was a mouse-driven title where players guide a sphere around the screen, collecting crystals while avoiding or shooting enemies. The action gets hectic on later stages where enemy numbers approach *Robotron* levels, and bullets ping dangerously around the arena.

LLAMATRON

Jeff Minter's loving *Robotron* pastiche dials down the rabid difficulty, and the result is a considerably more genteel offering with a liberal sprinkling of hairy Minter touches. Bouncing bullets, smart bombs and herd bonuses are just some of the goodies on offer, and you can even Blu-Tack two joysticks to the floor for the full arcade-style experience.

ROBOTRON X

Midway's 1996 3D revamp features super-enhanced hero U-Gene (geddit?) strapping on his blaster to fight a range of familiar enemies along with some all-new bad guys. It's a decent effort, with faithful 3D re-creations of foes and those famous shattering explosions, but the in-game camera can be a little disorienting at times.

GUN SPIKE (AKA CANNON SPIKE)

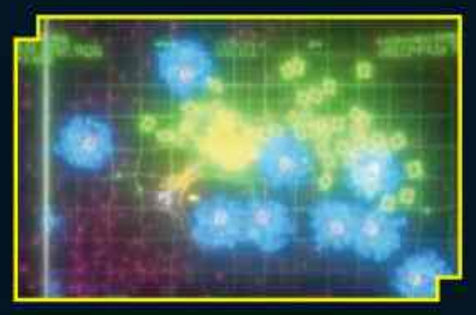
Developed by shooter king Psikyo in collaboration with Capcom, *Gun Spike* was a NAOMI-based arcade game that appeared to draw heavily from *Smash TV*. It features a variety of selectable heroes from previous Capcom arcade games, including Mega Man, Arthur from *Ghosts 'N' Goblins*, and Cammy from the *Street Fighter* series.

GEOMETRY WARS

Starting life as an Easter egg in *Project Gotham Racing 2*, *Geometry Wars* is probably the most well-known of the games that led the resurgence of twin-stick shooters. More free-form in design than *Robotron*, its glowing visuals and spectacular particle-based explosions were reminiscent of vector arcade games like *Asteroids* and *Tempest*.

MUTANT STORM

Another of the early games of the 'twin-stick revival', *Mutant Storm* displays plenty of evidence for *Robotron* being a major blueprint, in the same way its predecessor, *Space Tripper*, channelled *Defender*. An updated version, *Mutant Storm Reloaded*, was later released for the 360, while this original release recently made its way to iOS devices.



GEOMETRY WARS: RETRO EVOLVED 2

The mini-game proved popular enough for Bizarre to release a sequel, *Geometry Wars: Retro Evolved*. The second sequel was even better, and included modes like Pacifism, in which players have no weapons, and enemies can only be killed by flying through gates.

BLAST FACTOR

One of the first twin-stick shooters available for the PS3, *Blast Factor* features a concept pinched from Sixties sci-fi flick *Fantastic Voyage*, although sadly no Raquel Welch. Basically, you're stuck inside a body in a tiny ship, and the game revolves around battling hostile viruses and ridding surrounding cells of hostile infections.

EVERYDAY SHOOTER

Released on PC and PSN in 2008, this unique title, created by Jonathan Mak, is described by its author as "an album of games exploring the expressive power of abstract shooters". Against a soundscape of crunching guitar riffs, the game makes frequent visual nods to *Rez*, *Centipede* and *I, Robot*.

I MAED A GAM3 WITH ZOMBIES IN IT!!!

Despite its stupid title, *I MAED A GAM3* is a decent *Robotron* clone, with zombies, natch. The most impressive thing about this XBLIG title is how many it has sold – over 300,000 have blasted zombies and been driven nuts by the annoying background song to date.

BEAT HAZARD

This mash-up of *Super Stardust* and *Robotron* has a neat gimmick, allowing you to use your own music, from which the game spawns its own unique levels. But be warned: it features some of the most over-the-top strobe effects ever seen in gaming. If you thought *Space Giraffe* was a bit too in-your-face, you might want to give it a miss.

SCOREGASM

Charlie Knight's follow-up to *Bullet Candy* mixes Jarvis with trippy, Minter-esque visuals to create a game that's a bit tasty. Played across a branching, non-linear galaxy, creating a different experience each time, *Scoregasm* flings baddies, bullets and scoring opportunities at you thick and fast, and is a welcome addition to the genre.

BALLISTIC

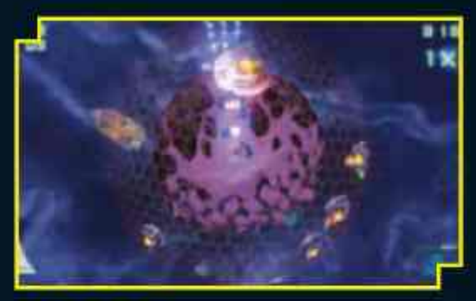
Indie developer Radiangames' debut release was a twin-stick shooter called *JoyJoy*. *Ballistic* carries on the tradition, being a lovely-looking blaster with an interesting weapon system and a surprising amount of depth. Those with 80 Microsoft Points to spare could do a lot worse than heading over to Xbox Live Indie Games to give it a go.

P-3

BatCat Games' innovative shooter sees you piloting a nano-ship in a Petri dish setting, striving to protect a central nucleus. One clever touch is the ability to use up the life force of the nucleus to give yourself a weapons boost, turn your ship into a projectile, or release a devastating shockwave. But take care: if the nucleus dies, it's game over.

ULTRATRON

Ultratron is a *Robotron*-esque twin-stick shooter, sporting attractive neon graphics and a variety of nifty power-ups. The opening stages are a little leisurely, but it doesn't take long before the game starts throwing ambush levels and bosses into the mix to add to the merriment. Best of all, the 360 version can be had for just 80 Microsoft Points.



SUPER STARDUST DELTA

Released on the Vita, this remarkably pretty game was the second twin-stick shooter in the *Super Stardust* series, following the acclaimed *Super Stardust HD*. The visual hook of both games is the rotating 3D 'planet' that spins below your ship as you move, scrolling orbiting asteroids and hostiles with it.

MINOTRON

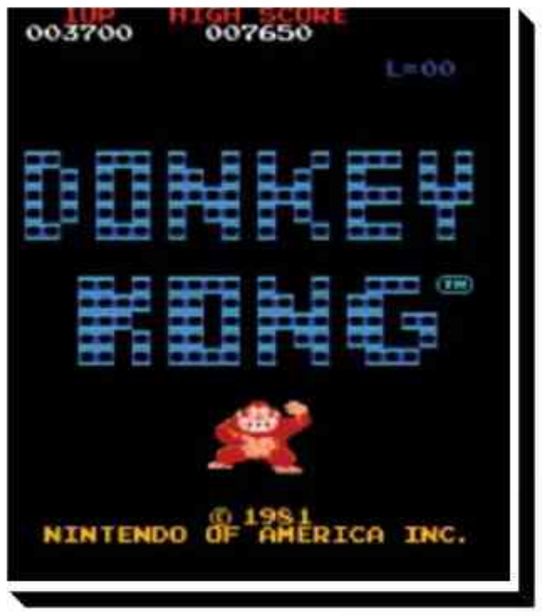
With 2010's *Minotaur Project*, Jeff Minter announced a return to the quick-fire production values and arcade-style purity of his classic catalogue. *Minotron* is a re-imagined take on *Llamatron* for iOS, with sprites lifted directly from the Atari ST original, and the return of old favourites like 'screaming Mandy' – the homicidal floating Mandelbrot.

IN THE KNOW

- **Publisher:** Nintendo
- **Developer:** Nintendo
- **Released:** 1981
- **Systems:** Arcade, Various
- **Genre:** Platformer

Donkey Kong

Martyn Carroll takes a definitive look back at Nintendo's timeless classic and unravels its brilliance by speaking to the very people who know the coin-op intimately



When it comes to iconic videogames, *Donkey Kong* is the daddy. Created by gaming legend Shigeru Miyamoto and released to huge success in 1981, it's one of the most celebrated and treasured games in history. It single-handedly defined the platform genre and introduced us to not one but two of the most popular videogame characters ever – the titular gorilla and his tormentor Mario. Such is its impact that some enduring videogame myths have built up around its creation. Was the game supposed to be called '*Monkey Kong*' but the name got misinterpreted somewhere along the way? Probably not. Was the game originally designed as a vehicle for Popeye and Brutus? Apparently so. Was the game responsible for saving an ailing Nintendo of America from certain bankruptcy, and providing the Japanese parent with the funding and impetus to develop the Famicom and therefore change the course of gaming forever? Quite possibly.

The facts are that in July 1981 Nintendo produced *Donkey Kong* as an upgrade kit for *Radar Scope*, its *Galaxian*-inspired game released the previous year that, despite initial success, had largely flopped in the US. The majority of US-based *Radar Scope* machines were converted, clearly indicating that the space shooter hadn't been pulling in as many quarters as hoped. The new game certainly did the trick, as Nintendo quickly went from manufacturing conversion kits to building dedicated cabs to meet the massive demand. This led to two cosmetic 'flavours' of *Donkey Kong*: the new, widely produced blue-coloured cabs with added side art, and the rarer converted *Radar Scope* cabs that retained their original red paintwork.

A year on from its initial release, *Donkey Kong* had reportedly earned Nintendo $180 million. This success led to a clamour of console and computer manufacturers looking to license the coin-op. Once more, the whole episode is now swamped in folklore, with deals done that supposedly led to lots of hand-wringing and toy-throwing. It's even commonly suggested that *Donkey Kong* played a part in scuppering negotiations that would see Atari release the Famicom in the US. All that aside, the deals resulted in Coleco receiving the home console rights and Atari settling for the home computer rights.

Coleco immediately played an ace by bundling the game with its ColecoVision console, causing hardware sales to skyrocket. It also put the game out on the Intellivision and Atari 2600 consoles. Such was the popularity of the game that even the scaled-down 2600 version shifted more than 4 million units, generating a massive $100 million in sales. Atari itself released the game on its 400/800 computers and ported it to several others, including the VIC-20, C64, TI-99/4A and Apple II. Inevitably, unlicensed clones with cheeky titles like *Donkey King* and *Killer Gorilla* flooded many computer platforms in the early Eighties. Nintendo, meanwhile, capitalised on the success of the original with a couple of arcade sequels and a range of Game & Watch handheld titles. Mario would, of course, go on to dominate Nintendo's character roster for the next decade, but our anthropoidal friend swung back into contention in the mid-Nineties with the release of a new *Donkey Kong* title on the Game Boy, and the first of Rare's *Donkey Kong Country* games for the SNES.

The original game may be approaching its 30th anniversary, but it's far from forgotten. In recent years it has been thrust back into the public consciousness thanks to the high-profile battles over the *Donkey Kong* high score world record. Die-hard players Billy Mitchell and Steve Wiebe have been involved in a long-running battle to claim the world record, with their efforts to one-up each other's achievements memorably chronicled in the 2007 documentary *The King Of Kong*. Earlier this year, a new competitor named Hank Chien entered the fray, so now it's a three-way fight for the most coveted title in competitive videogaming. In October 2015, Robbie Lakeman claimed the coveted title with a colossal score of 1,177,200 – but it will have probably changed hands again by the time you read this! ✱

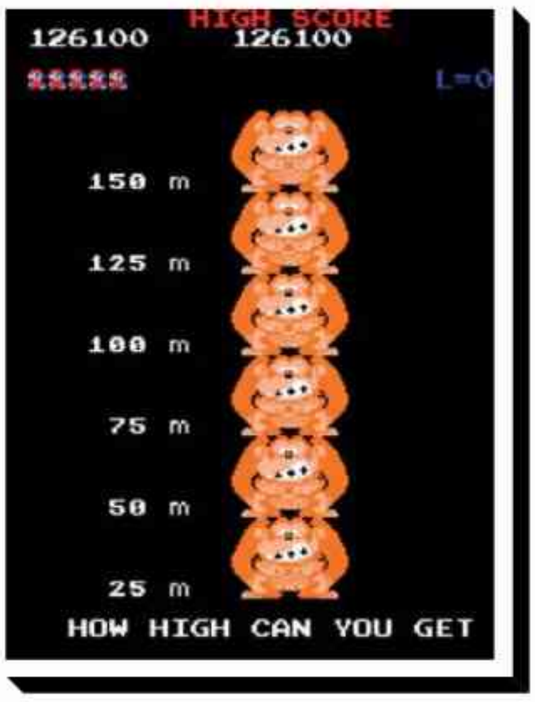
the expert

PROFILE

- **Name:** Hank Chien
- **Age:** 36
- **Date of birth:** 4 August 1974
- **Hometown:** New York, USA
- **Occupation:** Plastic surgeon

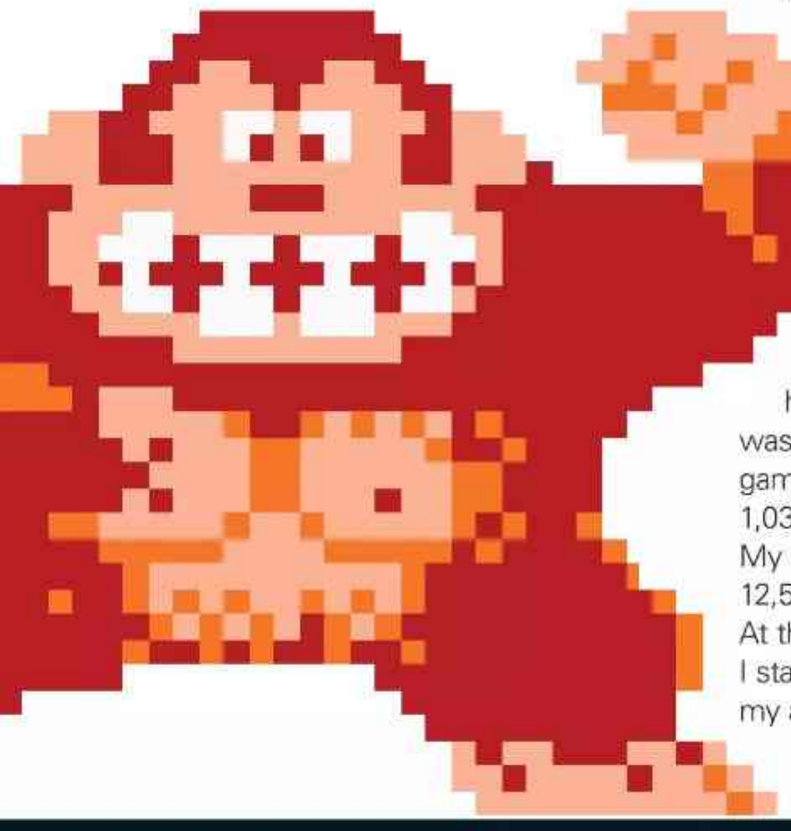
The battle to be 'King of Kong' was famously fought between Billy Mitchell and Steve Wiebe. That all changed in February 2010 when newcomer Hank Chien set a (now broken) new record

Is it true that you only started playing *Donkey Kong* after seeing the *King Of Kong* documentary?
I think I may have played one game of *Donkey Kong* prior to watching *The King Of Kong*, but yes, it's pretty much true I had never played the game. After watching the documentary, I decided to play just for fun. I had no idea where I could find a *Donkey Kong* machine, but I was aware of MAME. I improved very rapidly on MAME and after three months I reached the kill screen. At that point, I decided to find a public machine and thanks to the internet I found one pretty quickly at Barcade in Brooklyn. I then searched eBay and Craigslist for my own machine and after a few months I was able to find one in reasonable shape for a reasonable price.



» Upon passing the fifth level, the game loops until level 22, where a bug prevents further play.

» Is it better to take the low or high route? Expert players always opt for the latter.



At what point did you realise that you had a chance at the crown?
My initial intention was not to break the world record. I really was just playing for fun. In fact, I was going to try to break a million and then sell my machine. I wasn't even sure I could even break a million until I actually did it. It was 13 September 2009 and I had a business trip that day and had a flight to catch in two hours. My high score at the time was around 940,000. I started to play a game in those two hours and I scored 1,037,700 and barely caught my flight. My first million point game was only 12,500 points shy of the world record. At that point I realised I had a shot and I started playing seriously and recording my attempts.

Can you describe the events that led to you scoring 1,061,700 points on 26 February 2010?
After my first million point game, I actually did not play much because I was discouraged by the Twin Galaxies rules for scores over a million. Basically at that time it had to be done live in front of a referee. The rule was changed in November 2009, but with the holidays and work, *Donkey Kong* took a back seat. However, in early February I put my mind to it. In the coming weeks, I had several very close games, so I knew I could do it. Then came 26 February, a Friday. Ordinarily I would have been at work, but a huge snowstorm covered the city and my car was buried in snow so I was stuck at home with nothing to do but play *Donkey Kong*. In the evening I had a really good start and didn't die until late in the game. The rest is history.

Your achievement generated lots of press once Twin Galaxies verified it. It must have been a pretty crazy few weeks for you...
After I broke the world record it was really crazy. People were calling my office, my home, my parents' home, email, Facebook, you name it. I was flooded, and that's on top of my ordinary busy life. It was fun to get all that attention, but only for about a day!

Did Billy Mitchell or Steve Wiebe offer their congratulations?
Billy Mitchell acknowledged my achievement, but I have not spoken to him directly. I would like to meet him at some point. Steve Wiebe called and emailed to congratulate me personally.

Billy reclaimed the high score in July this year, then Steve grabbed

Platforming Perils

Things to look out for when attempting to topple the silly gorilla

Bloomin' Barrels
Jump them, smash them or simply avoid them. Just don't get flattened by them.

Flamin' Flames
The flames are a pain and they feature on most screens. Avoid them wherever possible.

Loopy Lifts
Be careful jumping to and from the lifts, and be sure not to get yourself caught up in the gears at the bottom.

Jumping Jacks
You need to position yourself carefully to dodge these fast-moving hazards. Tricky in later levels.

Pesky Pies
Don't end up with pie on your face. Time your jumps and beware of the conveyor changing direction.

» Hank pictured here practising on his very own *Donkey Kong* cab in his Manhattan apartment.

it once again in September. It looks like neither of these guys plan to give it up any time soon. Are you planning to try to take it back?
Steve is a great player and he has been working hard to reclaim the world record, so he deserves the top spot. Congratulations to him! I do plan on taking it back, but my main goal is to maximise the game to the best of my ability, whether it is a world record or not. In my original world record game, I held back a lot and made some careless mistakes, so I know I can do a lot better. To score high you have to take a lot of risks and be really aggressive.

■ **What kind of high score do you think is possible, with a perfect run?**
The current world record is nowhere near the maximum. The thing about *Donkey Kong* is that there are so many variables and so many ways to play the game, it's hard to say exactly what the maximum score is. I think that the achievable maximum score is close to 1.2 million, but it would require a lot of skill and luck to pull it off. The theoretical maximum is a lot higher – maybe 1.5 million. A great thing about the game is that the world record will always be beatable. This saga isn't over yet.

■ **There's been talk of *The King Of Kong* becoming a dramatised movie. If this happened and you were featured in the film, who would you like to play you?**
I don't think there are any Hollywood actors good looking enough to play me, but if I had to choose, maybe Brad Pitt or Johnny Depp could do it! ✱

HANK'S SURVIVAL GUIDE

Expert strategies from the newest challenger to the Donkey Kong world record

1 ■ TOP TIP
For beginners, just clear the boards as fast as you can. On the barrel board always keep an eye on the barrels above you and prepare for the worst case scenario. There really aren't many secrets; it's just a matter of practice.

2 ■ BONUS PLAY
When playing for a high score, it's a combination of knowing when to hang around and accumulate points and when to finish the stage to claim the bonus. It is not always beneficial to stay around on a board as the bonus timer ticks down very fast, particularly in the later levels. You have to know when you can 'beat the clock' and when you just have to call it quits.

3 ■ HAMMER TIME
Whether to grab the hammer or not is a complicated question. On the barrel board the top hammer is safe, but the bottom hammer is dangerous. I grab it when I'm playing for points but when I'm playing for survival I'll usually skip it. On the conveyers and rivets, that's even more complicated. I could probably write a short book on it.

4 ■ RIVET ROUTE
There are two patterns on the rivets that are commonly used, yet there is no consensus even among the top players as to which is better for survival or for points. In one pattern you clear all the rivets on the left and then try to grab the top hammer. In the other, you clear all of the rivets except the one on the level with the bottom hammer, then grab the bottom hammer and run across. Even those two patterns are not foolproof and you have to know what to do when it falls apart.

the sequels

There are dozens of Donkey Kong spin-offs, but only three true sequels

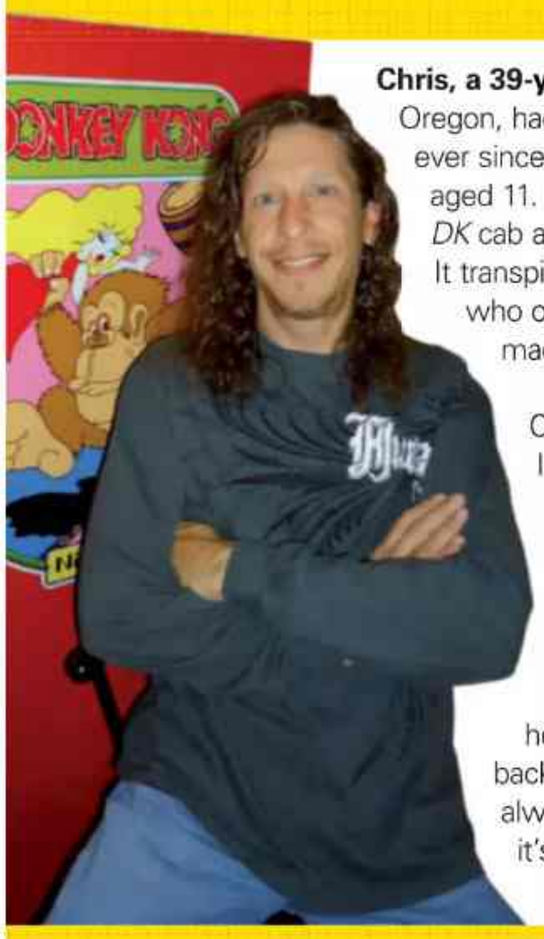
Donkey Kong Jr
Released: 1982
The success of *Donkey Kong* meant that the sequel arrived faster than a tossed barrel on a greased girder. But what's this? There's not a single barrel to be seen. Donkey Kong has been caged by Mario and the moustachioed one has unleashed all manner of jungle critters in an attempt to stop DK's plucky son from rescuing his dad. *Donkey Kong Jr* is a platform game, but a lot of time is spent traversing vines and chains, which can be cumbersome. It doesn't help, either, that Junior is rubbish at jumping, and the result is a slightly awkward sequel that, while utterly charming, lacks the smoothness and grace of the original.

Donkey Kong 3
Released: 1983
DK Jr played a little on the sluggish side, but you certainly couldn't level that at this fast-paced shooter that's far removed from the platforming roots of the series. The title character is once again the cranky nemesis, but Mario by now had better things to do, leaving goofy urchin Stanley to step in and deal with DK. The frantic action takes place over three stages set in a greenhouse, and in each one Stanley must continually blast the pesky primate with his insect spray gun, forcing him up into the rafters where stinging bees ultimately await him. It works brilliantly as an arcade game, in that you offer up a credit and get your five minutes of fun, but the game lacks variety and doesn't warrant repeated plays, thereby denying it the lasting appeal of its forebears.

Donkey Kong (GB)
Released: 1994
When it comes to resurrecting and reinventing a franchise, nobody does it better than Nintendo. This game, launched alongside the Super Game Boy in 1994, is a perfect example. It begins as a nifty homage to the original coin-op, with the arcade's four screens authentically reproduced with a few little extras thrown in, but instead of the game looping back to the beginning once DK hits the deck, it instead presents the player with a squillion extra screens to negotiate. In the majority of these, Mario must find an oversized key and carefully carry it to the locked door, which leads to the next level. Part-puzzler, part-platformer, this is an excellent update that deservedly spawned its own spin-off series in the *Mario vs Donkey Kong* games on the GBA and DS.

the machine

Donkey Kong fan Chris Ellison shows off his rare red-coloured machine, which he has painstakingly restored to mint condition



Chris, a 39-year-old IT support worker from Gresham, Oregon, had hankered after his own *Donkey Kong* cab ever since first playing the game in his local bar and grill aged 11. He ran an ad on Craigslist looking for a red *DK* cab and a lady not too far away answered his call. It transpired that she'd acquired it from a local vendor who originally purchased it new as a *Radar Scope* machine. Unfortunately, it needed a lot of work.

"It was one step away from a landfill," Chris tells us. "The bezel was so scratched I could barely make out the monitor. The coin door was rusted and the coin mechs were jammed up. To make matters worse, someone had attempted to cut a hole in one of the sides. I wanted a red *DK* really badly but man, this thing was a mess."

Undeterred, Chris transported the cab home and began the process of bringing it back to its brilliant best. "*Donkey Kong* was and always will be a passion for me," he says, "and it's just as much fun now as it was back then."

CABINET

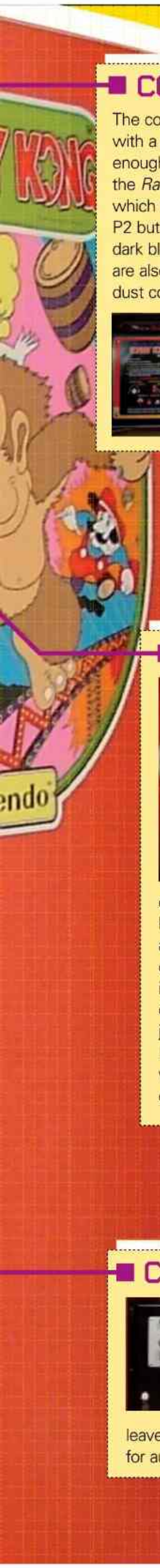
To restore my *Donkey Kong*, I began by lightly sanding down the entire cabinet to give the primer something to adhere to. All of the imperfections including the busted edge and the place where someone had attempted to cut a hole were reconstructed with Bondo putty and sanded flat. The primer was shot with a spray gun. I couldn't get the oil paint to shoot correctly so it was applied using a foam roller. The paint colour was matched by removing a red chip from underneath the coin door where it hadn't seen daylight since 1981.

MONITOR

The monitor is the original Sanyo 20EZ that has been recapped – this is where all the capacitors on the monitor PCB are replaced. It is currently using the original flyback.

BOARD

The original board had developed bad RAM somewhere. Since I don't have the expertise to do this kind of a board repair, I sent it to Dick Millikan of Auburn, Washington, who is known for board repairs. Dick sent me a working board. Being a huge *Donkey Kong* fan, it was mandatory that the Brasington kit was installed. This is an add-on kit that enables the game to save high scores. It's also necessary if you want to install the *D2K: Jumpman Returns* hack. *D2K* is amazing!



CONTROL PANEL

The control panel has been replaced with a reproduction. Interestingly enough, the original panel was using the *Radar Scope* red button for jump, which I chose to re-use. The P1 and P2 buttons are the original Nintendo dark blue. The new instruction cards are also reproduction, as well as the dust cover.

ARTWORK

The control panel itself is in good shape. It is not dented, warped, or Swiss-cheesed. The control panel overlay is in decent condition, though it has a hole worn in it at the front. I have a new overlay for it that I found on eBay about a year ago. I will install it when I restore the machine cosmetically. Regarding the joysticks, which are Seimitsu/SNK LS-30s, one of them was new when I got the machine, while the other has moderate wear.

COIN MECH

The coin mechanisms are original. I decided to paint the coin door and leave the coin entry wear marks for authenticity's sake.

developer Q&A

We speak to industry veteran Garry Kitchen to find out how he managed to squeeze Donkey Kong onto the Atari 2600

How did you get into game development?
In the mid-Seventies, while in college studying electrical engineering, I was hired by a small engineering consulting company. Among other projects, I developed and patented a handheld billiards game called *Bank Shot*, based on a 4-bit microprocessor and an array of 72 LEDs. When the Atari 2600 came out the handheld games started to suffer at the expense of the newest, greatest thing – videogames. In response, I bought an Atari machine, opened it up and reverse-engineered it so that we could compete in that space. I've been developing games ever since.

How did you land the job of converting *Donkey Kong* to the Atari 2600?
At the time, around 1981/1982, there weren't a whole lot of independent videogame developers who knew how to program the Atari 2600. I had the knowledge as I had reverse-engineered the platform the previous year. My brother Steve owned an engineering company and he had a relationship with an executive at Coleco – I believe his name was Eric Bromley. Steve got the *Donkey Kong* contract with Coleco and subcontracted the project to me. It's all about relationships.

Did you get any assistance from Nintendo?
No, nothing. My only source was the actual arcade game. I had direct access to a machine, which Coleco provided, but I didn't get to keep it!

What would you say was the most challenging aspect when working on *Donkey Kong*?
I wanted the 2600 version to look just like the arcade game, but there was a technical problem. The Atari hardware did not have enough memory to display a full bitmap background – the background memory only held enough bits to cover half the screen, so the video display driver would display either a repeating pattern or a reflecting pattern. With this limitation you could not display the slanted ramps that were such an important aspect of the look of the game. This frustrated me until I came up with a technical solution to overcome the limitation, allowing for slanted ramps. It required a rewrite of much of the code but I think it was worth it.

How long did you work on the game, and were you up against a deadline?
It was a three to four month schedule, which was about half the time that should have been allotted. The deadline was immovable, with the ROM cartridge needing to go into manufacturing in time for a holiday shipment. I worked without sleep for the final 72 hours to deliver it on time. It took me a month to physically recover from the ordeal.

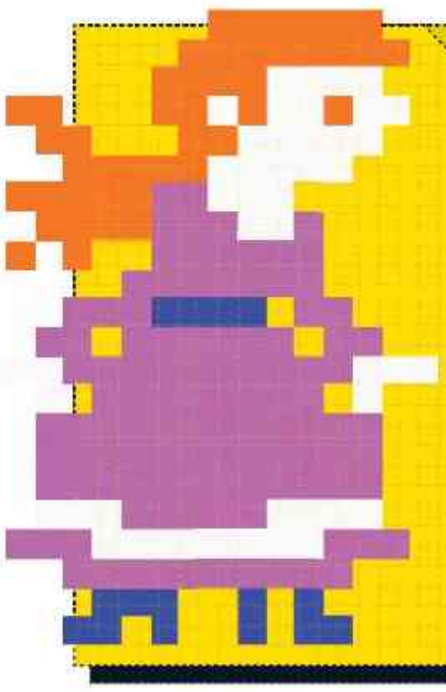
The game is often criticised for only featuring two of the original's four screens. Given more time, do you think you'd have been able to squeeze in those extra screens?
There were two factors that prevented me from including the other two screens. The cartridge was 4KB in size, and the beta version of the game, after three months of labour and two screens complete, came in at around 6KB. I was over by 2KB. Bigger cartridges were available, but Coleco made the financial decision not to go for an 8KB cartridge, despite my recommendation and pleading. So, rather than having an extra 2KB to play with and add more screens, I had to spend the last month crunching out 2KB just to make the two screens fit in a 4KB cartridge. The second factor was the schedule. There was no time left. The other screens would have been impossible on the allowed schedule.

The game was a huge seller, with sales of more than 4 million units. Were you lucky enough to get a slice of the profits?
I got a very, very tiny slice. Enough to make it worthwhile, but I certainly didn't get rich off it.

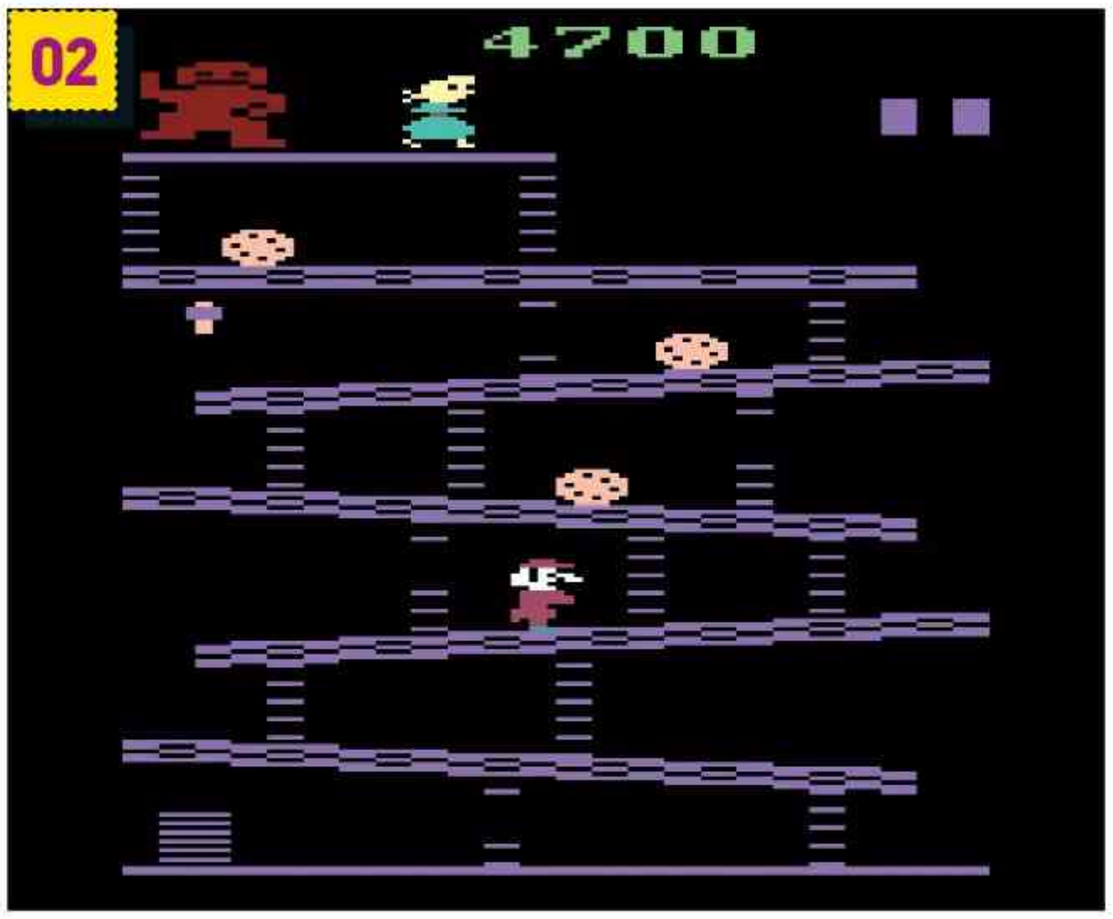
Looking back, how do you reflect on the game?
Not to pat myself on the back, but I still love the game. I thought it turned out pretty well. From my perspective I focused on the quality of the game experience that was in the cartridge rather than lamenting the fact that the other levels were missing. I really wanted to get the iconic first level, with Mario jumping over barrels, to feel as close to the arcade game as possible, and I'm comfortable with how that turned out.

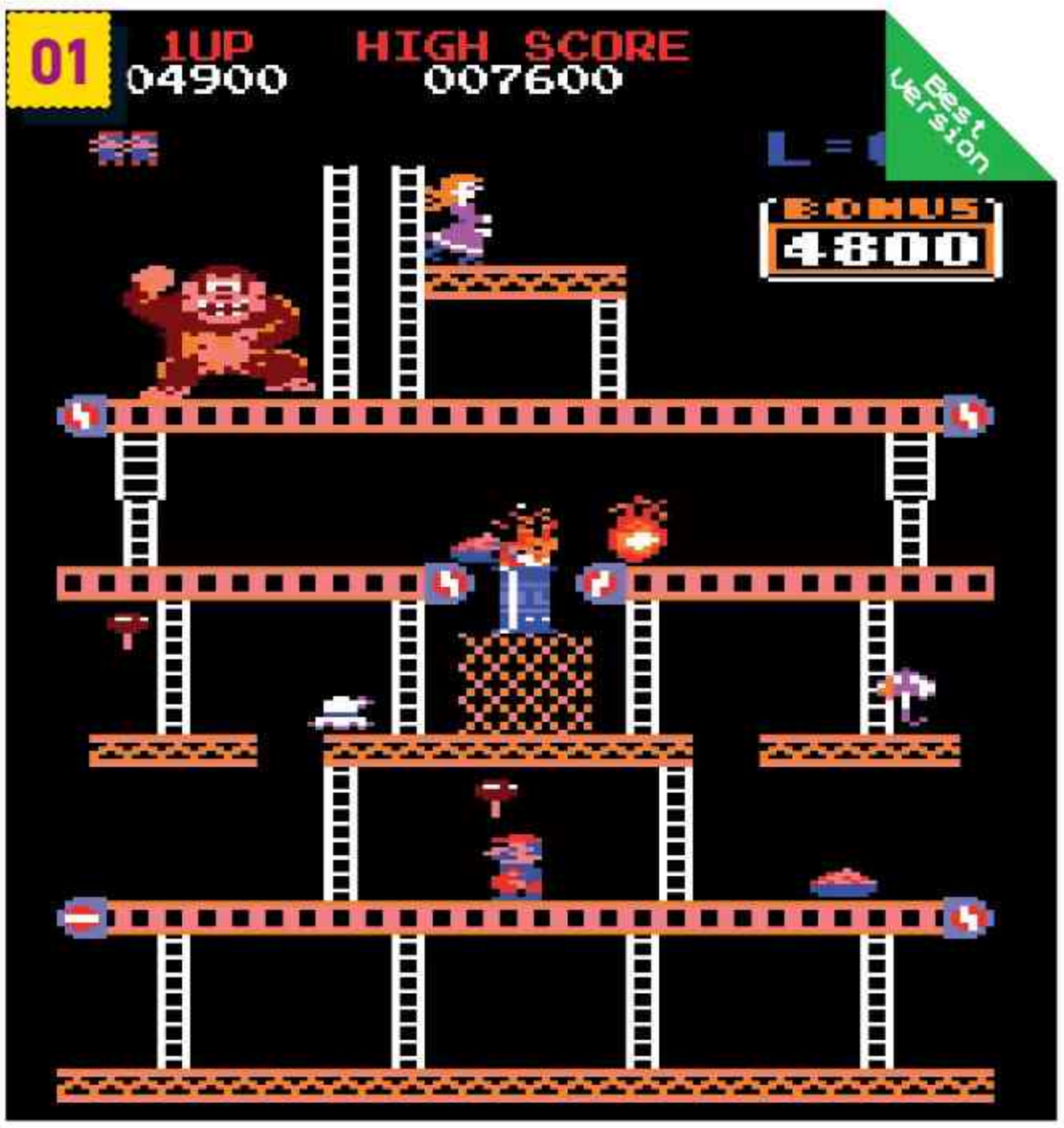
These days you're involved in iPhone development at AppStar Games. What's your take on the Apple devices' importance?
The importance of the iPhone cannot be overstated. The single most important thing it has done is change the buying habits of the videogame consumer. Two years ago my eight-year-old son would ask me for a $30 cartridge for his Nintendo DS. Today he asks me if it's okay to download a $0.99 iPhone game, and he's equally satisfied with the experience. Apple has taught the consumer that good games can be had for under $2 and the games industry will never be the same. The genie is out of the box and the industry will never get it back in.

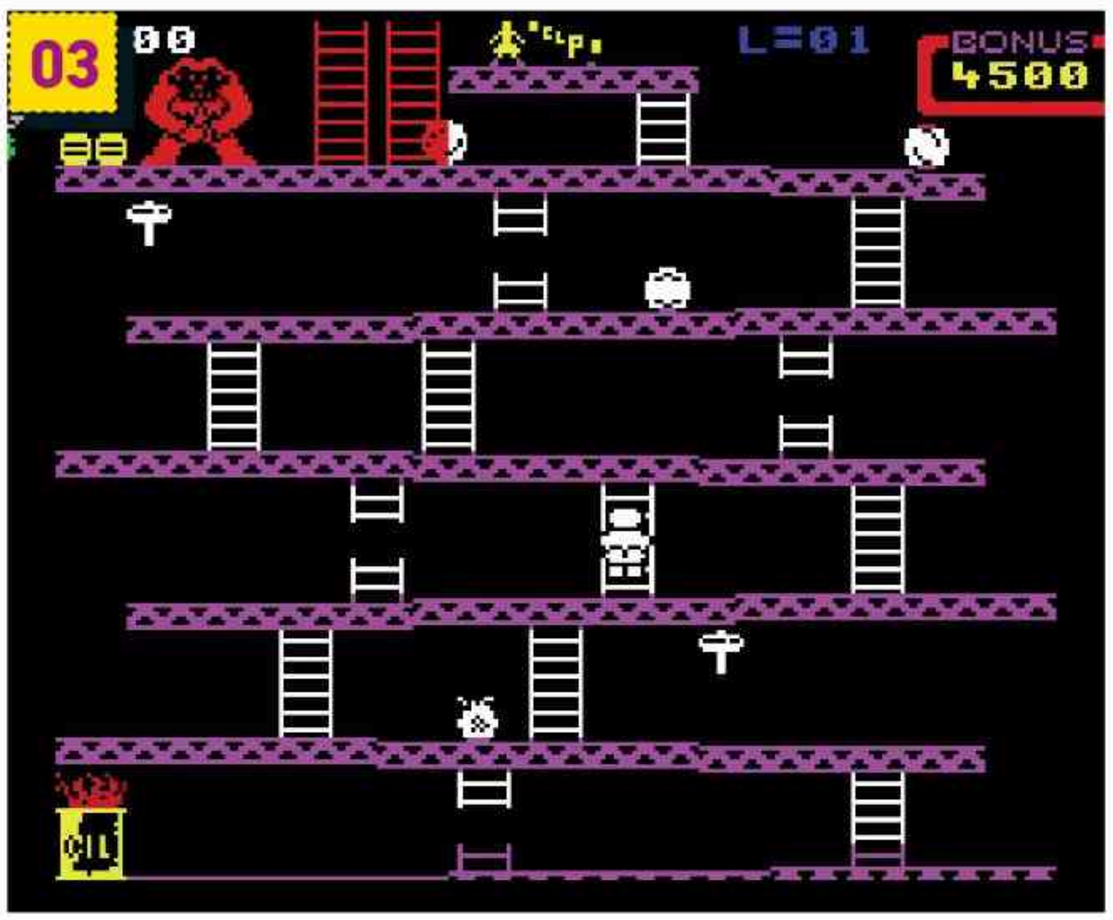
The conversions



Naturally, one of the most popular arcade games of all time has more than its fair share of home conversions. Here is the lowdown...







01. CPC (Best Conversion)

That Stuart Campbell awarded it the prestigious accolade of best 8-bit arcade conversion of all time back in issue 76 should be a big indicator of how good this version plays. Featuring big, bright colourful visuals, faithful gameplay, and all four stages, it's a nigh-on perfect conversion for Lord Sugar's unfairly mocked wonder machine, which is why we're awarding it best conversion.

02. Atari 2600

This is a poor conversion, even by Atari 2600 standards. It's missing two stages (Cement Factory and Spring), DK looks like a deranged gingerbread man, the barrels look like cookies, and the behaviour of the enemy flame sprites – they simply yo-yo from one end of the screen to the other – is easy to circumvent. The controls aren't great either.

03. Spectrum

Poor graphics aside, the intensity at which Kong lobs his barrels is relentless, and coupled with Mario's weedy jump is a perfect recipe for irritation. In this version it also takes Mario an unnecessarily long time to climb ladders – although this might have something to do with the giant arse that Sentient Software has retrofitted him with, only visible when he's climbing ladders.

04. C64 (Atarisoft)

This superb version by Douglas D Dragin is another great port. Released in 1983, it's the first official port to include all the stages – impressive considering it was one of the earliest titles for the C64, and subsequent ports on machines boasting far more tech managed just three. With great presentation, and the option to tweak the difficulty of the game, this is generally the more popular of the two C64 versions that saw release.

05. C64 (Arcana)

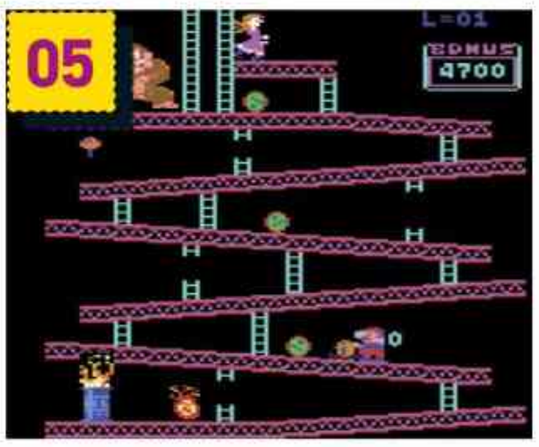
As well as the great Atarisoft offering, C64 owners received this equally impressive one by Arcana, which also did the CPC version. Featuring all four stages – although this time it's worth noting that they follow the original Japanese level order – great sounds, smooth gameplay and all the cut-scenes, it's another great conversion.

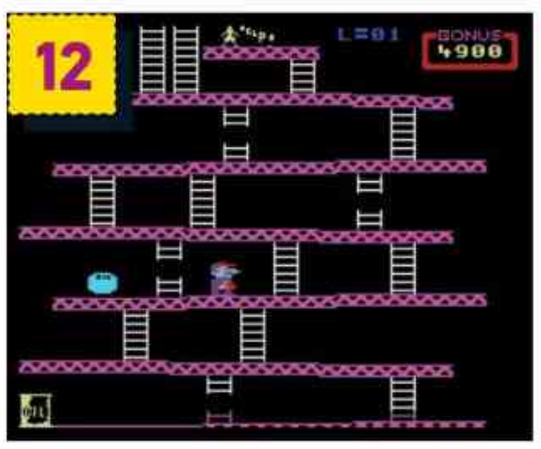
06. NES

As you would expect being on the NES, and from Nintendo, this is a great conversion. The visuals look authentic, and the gameplay and controls are solid. It's missing the Cement Factory stage and the sounds and music differ from the arcade version. This is the most popular of all the home conversions, which is why the cart stayed in production for a staggering five years.

07. Apple II

Despite no Cement Factory, this conversion still offers an authentic game of *DK*, delivering some of the more trivial





elements of its arcade parent – such as the 'how high can you get' intro screen and the inclusion of Pauline's girly possessions – at the price of good graphics and sounds. It's the nippiest conversion of the game out there, and one of a handful to allow players to tweak the difficulty.

08. ColecoVision

Once again no Cement Factory stage, but nonetheless a decent effort that looks and plays well. Unfortunately its controls let it down, though this has more to do with the inaccurate nature of the console's disc-stick controller than anything else. Coleco also released a version for its Coleco Adam computer. It doesn't look as good as the console port, but it does include all four stages.

09. VIC-20

The graphics are below par, and the game isn't very smooth, but it's not all bad news: the game sounds fantastic, and, amazingly, features all four stages, which is really quite unbelievable. This is as good a job as Atarisoft could be expected to muster up on the modest tech. Taking this into account, this is another decent conversion of *DK*.

10. TI-99/4A

Biggest surprise of the night, though, goes to this fantastic conversion for the TI-99/4A. While the visuals look a little washed out, and the sound effects are painful, the sprites do look nicely detailed and the game is the complete package featuring all four levels from the arcade game in the US order. The gameplay is nice and smooth too. A great conversion.

11. Atari 800

Without doubt the best version to be found on an Atari machine, and was another of a disproportionate number to include all four stages. There are slight differences to the arcade original that only astute *Donkey Kong* fans will pick up on, but most will see this as a good-looking and complete port that certainly puts the dismal 2600 effort to shame.

12. MSX

Unsurprisingly, the MSX conversion, which was also by Sentient Software, suffers from the same issues that plague its similar Spectrum port – namely it doesn't look great and Donkey Kong seems to be working himself into an early grave at the top of the screen. This is probably the worst of all the conversions published by Ocean.

13. Intellivision (Worst Conversion)

Mario looks like Q*bert in dungarees, Donkey Kong like Swamp Thing, and Pauline like an orange dinosaur. It only features two stages and it controls like a dead body. It's rumoured that this version, developed by Coleco, was so bad that, upon seeing it, Mattel thought the company was trying to sabotage its machine. We can believe it.

Out

Run

JONTI DAVIES MEETS YU SUZUKI – LEGENDARY GAME PROGRAMMER, FERRARI OWNER AND PART-TIME PHILOSOPHER – TO DISCUSS SEGA'S MOST ICONIC DRIVING GAME, THE 1986 CLASSIC THAT IS OUTRUN

Yu Suzuki joined Sega in 1983, his first assignment was *Champion Boxing* on the SG-1000. From there, Suzuki's progress began to gain momentum. By the end of 1985 he had already established himself at the vanguard of coin-op development, having masterminded a couple of major successes for Sega in the form of *Hang-On* and *Space Harrier*. But Suzuki's journey towards becoming a legendary videogame producer was about to shift to a higher gear, and it was the following year's *OutRun* driving game that turned Suzuki into an internationally renowned programming superstar.

Before a brief diversion to code the thrilling sci-fi blast of *Space Harrier* in time for a December 1985 release, Suzuki's attention was first centred on the racing genre. The result of Suzuki's initial drive was *Hang-On* (which appeared in Japan's arcades in July 1985), a high-speed bike racing game where players literally felt as though they had to hang on to the coin-op cabinet's handlebars. Part of Suzuki's motivation for *Hang-On*'s production was a desire to see to it that Sega overturn Namco as Japan's leading manufacturer of racing games, and while *Hang-On* was a superb title – and one which radically altered Sega's image – he accepted that his first racing game alone hadn't been sufficient for Sega to overtake its main rival, the developer of *Pole Position*. Namco was still synonymous with driving games; Sega was being lapped. Suzuki wasn't fond of repetition, so instead of producing another bike racing game he opted to create the car driving game that would become *OutRun*.

Well, that's one side of the story. The other, less weighty but equally important reason for Yu Suzuki's determination to create *OutRun* came from a Burt Reynolds flick, as he confesses to us: "The main impetus behind *OutRun*'s creation was my love of a film called *The Cannonball Run*. I thought it would be good to make a game like that. The film crosses America, so I made a plan to follow the same course and collect data as I went. But I realised, once I'd arranged everything, that the scenery along the [pan-America] course actually doesn't change very much, so I revised my plan and decided to collect data in Europe instead..." Although *Cannonball Run* clearly had a great influence on Suzuki's work with *OutRun*, the game also bears what must have been a coincidental similarity to the euphoric scene in *Ferris Bueller's Day Off* (also a 1986-vintage production) in which Ferris, the sassy Sloane at his side, speeds off in a rosso corsa Ferrari 250GT. Regardless, Suzuki's attention had been diverted away from America, towards Europe.

Suzuki's maverick approach to game development would, during the Nineties, become accepted practice (12 years later, for example, fellow Sega-man Yuji Naka would take his *Sonic Adventure* team to South America purely for research purposes), but in the mid-Eighties Suzuki was already doing things the interesting way, literally journeying around the world just to make sure that his game would be the real deal. Suzuki's plans culminated in a European research adventure. "Because of the 'transcontinental' concept," he recalls, "I felt that I should first actually follow such a course myself, collecting information with a video camera, a still camera, and other equipment. I started out from Frankfurt, where I hired a rent-a-car, and I installed a video camera on the car. I drove around Monaco and Monte Carlo, along the mountain roads of Switzerland, stopping in hotels in Milan, Venice and Rome, collecting data for a fortnight. I have many happy memories of that trip. There were many places I visited where communicating in English wasn't sufficient: one time, when ordering a meal, I thought I had asked [in a European language] for a single bowl of soup but was surprised when four bowls of soup were brought to me!"

Soup or no soup, there was still much work to be done during Suzuki's fortnight in Europe. "The next step was to talk with local people in the places I visited, and [later] to make those discussions and other episodes reflected in the game," Suzuki remembers. The result was a unique videogame snapshot of the

IN THE KNOW

- **PUBLISHER:** SEGA
- **DEVELOPER:** AM2
- **RELEASED:** 1986
- **SYSTEMS:** ARCADE, VARIOUS
- **GENRE:** DRIVING

VERSION EXCURSIONS

Sega Mark III/Master System
This was the first console conversion of *OutRun*, appearing in Japan on 30 June 1987 – less than 12 months after the coin-op debuted in Japan. It wasn't a bad effort, either: in terms of presentation it's superior to most 8-bit computer versions, and the game also supported the Mark III's Yamaha YM2413 FM sound unit, which helped ensure the soundtrack didn't sound too far removed from the original tunes heard in the coin-op.

Mega Drive
In August 1990 *OutRun* was released on a Mega Drive cartridge, having been successfully ported to the console by conversion specialist Sanritsu Denki (now an independent developer known as SIMS, this company was at the time wholly owned by Sega). The Mega Drive version of *OutRun* was notable for featuring a new, exclusive song called *Step On Beat*.

PC-Engine
This Japan-only PC-Engine conversion by NEC showed up at the end of 1990. It's an excellent piece of work, easily outstripping the Master System version while giving the Mega Drive release a good run as well – in spite of the supposed superiority of the Mega Drive hardware.

Sega Saturn
The brilliant Saturn version of *OutRun* was released in Japan under the Sega Ages banner in September 1996. Not only does this disc contain both the Japanese domestic and international variations on the arcade code, but it also features a 60fps refresh rate that outperforms the coin-op's 30fps standard. The Saturn build even includes newly arranged versions of the classic four-song soundtrack, which were personally reworked by Hiroshi Kawaguchi in early 1996. This *OutRun* release was handled by Game no Rutsubo, another specialist Japanese conversion outfit.

Dreamcast
While certainly highly respectable versions of the game, *OutRun* in both *Shenmue II* (where it appeared as a mini-game) and *Yu Suzuki Gameworks* (as part of a five-game retrospective compendium) differs from the original arcade in a couple of areas: specifically, the player's car is a generic Ferrari-style motor but not the original Testarossa design, while the timbre of the music is also slightly changed. In spite of these discrepancies, both Dreamcast appearances were in fact produced by Game no Rutsubo, who had done such a spellbinding job with the Saturn version.

Game Gear
This was the first handheld version of *OutRun*, released in 1991. As expected, the Game Gear version struggles to re-create the look of the coin-op, but it does succeed in achieving a first for *OutRun* outside of the arcade: plug in a Link Cable and two-player racing becomes an option.

Game Boy Advance
This surprisingly fine version of *OutRun* appeared along with dinky takes on *After Burner*, *Space Harrier* and *Super Hang-On* as part of the Atari-published *Sega Arcade Gallery*, which was released in the UK in January 2003. Ironically, in spite of its quality, the Bits Studios-converted GBA *OutRun* never appeared at retail in Japan.

Mobile
OutRun on a mobile phone? Yep, and there are some keitai versions available in Japan that look superior to some of the 8 and even 16-bit console renditions of the game. Shame about the controls, though…

Commodore 64
The loading times on this 1987-vintage C64 version were unbearable, and the gameplay wore livery that was only vaguely similar to the real *OutRun*. There was no choice of routes, and only *Magical Sound Shower* and *Splash Wave* were represented (albeit in an approximated way) on C64 *OutRun*'s soundtrack. On the plus side, there were a few POKEs you could input to either stop the clock from ticking down or to enable you to pass through other vehicles. Thank goodness for the Saturn.

Sinclair ZX Spectrum
The Probe-developed 1988 Speccy version of *OutRun* was, like the Commodore 64 release, published by US Gold. Also like that Commodore 64 title, it was barely a fraction of the game that players knew from the arcades.

Amstrad CPC
OutRun on the CPC, also released in 1988 and programmed by Probe, wasn't much better than the Spectrum version: it had no in-game music, and again it looked like a distant, ugly relative of the coin-op. On the plus side, CPC *OutRun* had the proper route-switching setup (which the Commodore 64 release infamously was without) and it was bundled with a tape of the music from the arcade version, so you could stick that on the stereo while playing and sort of trick yourself into believing you had a virtual arcade in your bedroom.

MSX/MSX2
OutRun on the MSX and MSX2 was released in 1988. It was a simple reduction of the coin-op, looking even more stripped-down (although a lot more colourful) than the C64 version. Although MSX *OutRun* was released immediately after the FMPAC sound source cartridge came out, this Pony Canyon-published release failed to take advantage of the new hardware add-on, resulting in a blippy-sounding mediocrity.

Commodore Amiga
For those who were lucky enough to own an A500 as early as 1989, Probe had an Amiga conversion of *OutRun* that resembled the coin-op much more closely (at least to the point where it was obvious what the source material was) than the CPC and ZX versions it had also coded.

Atari ST
Likewise, the ST version of *OutRun*, which was released in 1988, shortly before the Amiga build appeared, was a continent away from the 8-bit computer ports it outran.

DOS
DOS users weren't left out of the *OutRun* conversion circus, either: Sega published a version programmed by Distinctive Software employees (under the Unlimited Software alias) in 1989. It was a worthy effort, although the Amiga and Atari ST versions had greater shine.

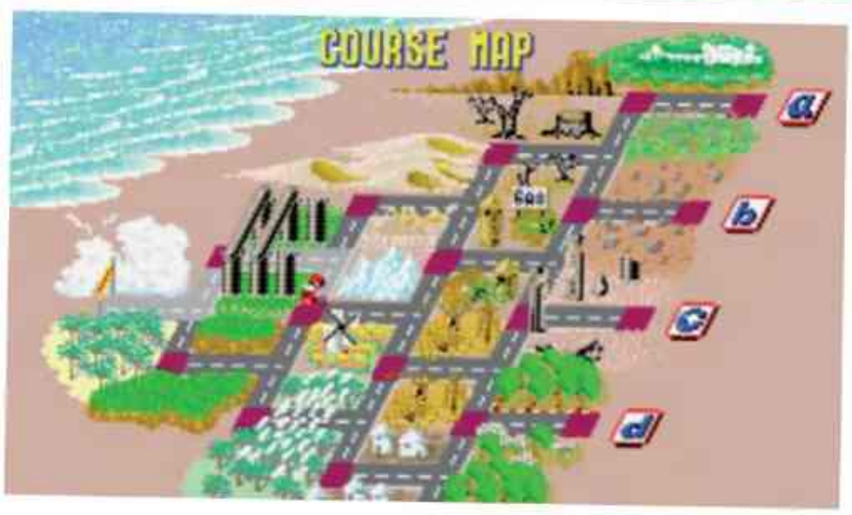
mid-Eighties, a Japanese interpretation of European geography. *OutRun* is in many ways the game that is most representative of bubble-time Japan's extravagances: it's a production with concessions to luxury (driving a Ferrari Testarossa, sitting inside a state-of-the-art coin-op cab), taken at endless high speeds across effusively bright European-styled country, all to an inspirational soundtrack where the only hint of melancholy arrives beyond the final checkpoint, as *Last Wave* fades out.

Even while the bubble lasted, however, there were some limits. Sega's resources were not endless and the technology available to Suzuki at the time – while fearsomely powerful compared with other hardware of a mid-Eighties vintage – didn't stack sufficient memory to facilitate all of Suzuki's dreams. As a consequence of these and other factors, most notably a lack of time, Yu Suzuki found it necessary to make a few compromises during *OutRun*'s development. It turns out that these cuts were not to any great gameplay detriment, yet Suzuki was instinctively unhappy with being forced to sacrifice any of his ideas: "I was only able to put around half of the things I wanted to do into *OutRun*," he says. "Because of budget and development time limitations, some of the contents I'd planned had to be squeezed or cut. I'd made preparations for eight individual characters and I wanted to include various events at each checkpoint, which would have made the player experience a story; something like the *Cannonball Run* film. I also wanted to give players a choice of supercars to drive, so that they could enjoy differences in car performance."

Of course Suzuki's hoped-for garage of driveable Ferraris was eventually realised to near-perfection in 2003's *OutRun 2*, but for the original game he had to be satisfied with just one Ferrari. "Naturally I was yearning for Ferraris," Suzuki says. "Above all, the most talked-about car of the time was the 12-cylinder Ferrari Testarossa. The first time I saw the car was in Monaco, and I was really moved by its beauty – I thought, 'there is no choice: this is the only one'. There are many other charming Ferraris, but memory problems made it impossible to include them in the game… So we decided that the player's car should be the 12-cylinder Testarossa."

On returning to Japan, Yu Suzuki and his team set out to conduct further research. Suzuki had already explored the

» Selecting a track from the car stereo is one of *OutRun*'s simple joys.



"Five of us squeezed into a car and drove for three hours to see a [privately owned] Testarossa"

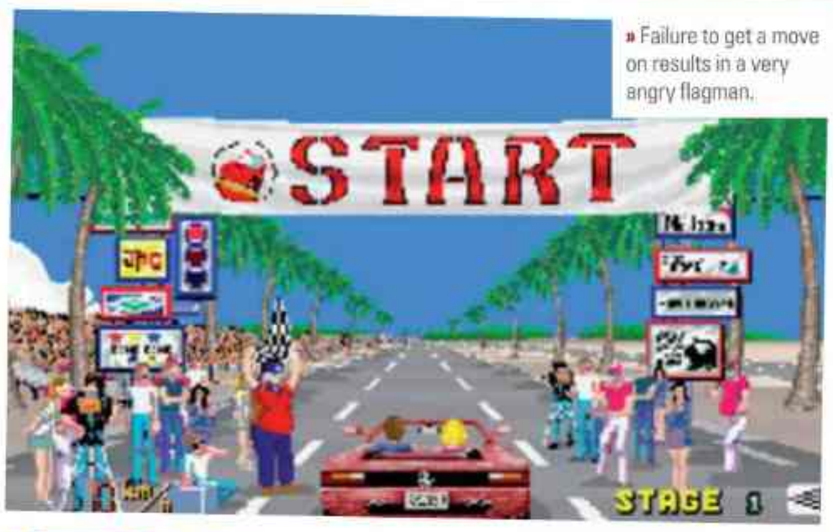
YU SUZUKI ON HIS TEAM'S DEDICATION TO FERRARI'S HOTTEST CAR OF THE EIGHTIES

potential for *OutRun*'s scenery and environment throughout his European rent-a-car expedition; his team's next objective was to learn more about the Testarossa, but this was fraught with problems, as Suzuki relates: "Only a tiny number of Testarossas had been brought into Japan, so we had some trouble finding an owner to help us with collecting car data. Eventually, five of us squeezed into a small car and drove for three hours to see a [privately owned] Testarossa. We took photos of it from every side, at five-degree intervals, and we also recorded the sound of the engine."

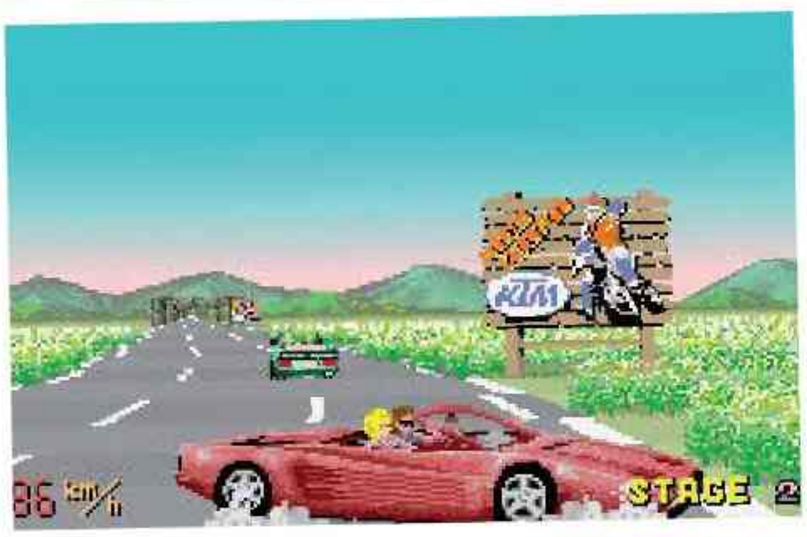
Suzuki's work on *OutRun* was a model of thoughtful, conscientious design. Suzuki has previously spoken of keeping a notepad and Dictaphone next to his bed, so that he could quickly note any ideas he had in dreams. It's no coincidence that *OutRun*'s opening stretch of road is traffic free: this was to ensure that players stood no risk of being discouraged by suffering a collision early in the game, so soon after inserting a 100 yen coin to play. Instant explosions on collisions between vehicles, too, in spite of being prevalent in racing games prior to the *OutRun* era, were not to Suzuki's liking, and he deliberately omitted this faddish conceit when designing both *Hang-On* and *OutRun*. On the other hand, Suzuki reckoned that zooming out into the lead and then just staying there for the rest of the race wasn't much fun either, which is partly why *OutRun* is a race against the clock, rather than an inter-vehicle competition.

Yu Suzuki's personal gameplay preferences happened to be in tune with those of the majority of players, leading to design decisions that would help *OutRun* to push driving games away from their tendency towards 'the impossible', as Suzuki explains: "At the time of *OutRun*'s development, driving games were made whereby a collision with another car would automatically result in an explosion, and they had many things that would be impossible with real cars. Even if you were good at driving actual cars, the skills needed in those games were completely different. I wanted to make a driving game where people who were skilful drivers of cars could also achieve good results in the game. For that reason, where at all possible, we simulated features such as horsepower, torque, gear ratios and tyre engineering close to those of real cars. For features that were difficult to control, we added AI assistance. For its time, I think the level of *OutRun*'s production was very high."

The AI assistance Suzuki speaks of was used to particularly good effect with the handling of the Testarossa. The 'drift' techniques Japanese racing game developers tend to talk about are, according to Suzuki, essential in good driving games – if the car's tyres grip the road surface too closely, the handling of the car will be too twitchy – but prior to *OutRun* this wasn't commonly appreciated by driving game developers. The response of *OutRun*'s Ferrari was pitched perfectly, however, neatly averting all of the frustrations that players feel when they're attempting to control cars which are prone to understeer, oversteer or 'twitchiness'. And it's just as well, really: not only did *OutRun* present endless one-way traffic through which you had to weave a path, but it also presented a choice of routes at the end of each stage, demanding that you swerve left or right to head towards the next easier/trickier area. In a game as gorgeous as *OutRun*, while the primary thrill was in the ride, part of the fun was just seeing what the next stage looked like. Suzuki concurs,



» Failure to get a move on results in a very angry flagman.



» The opening stretch of track was kept free of traffic so as not to deter players too early on.

THE CAR IN FRONT IS A TESTAROSSA

Turbo OutRun
Turbo OutRun was the first of many pseudo-sequels to Yu Suzuki's original formula, and this one gets even closer to the *Cannonball Run* inspiration by virtue of its setting as a pan-America race. It also introduced a turbo feature for limited quick boosts.

Battle OutRun
An exclusive game for the Sega Master System, *Battle OutRun* stripped away all of the notions of luxurious driving from the original *OutRun* game and replaced them with cheap criminal-chase 'thrills'. Hmm.

OutRun Europa
This entry in what was becoming a series of sort-of *OutRun* games appeared on the Game Gear, SMS and C64 in 1991. It tried to be the Sega-authorised contender to Taito's excellent *Chase HQ*, but failed due to shoddy design and cheap production values.

OutRun 3-D
Another SMS release, *OutRun 3-D* was designed to take advantage of the SegaScope 3D Glasses. It seemed futuristic, although the developer's lack of confidence in the concept was belied by its reassurance-veiled-as-a-boast, "WITH 2-D MODE!"

OutRun 2019
F-Zero meets *OutRun* in this Mega Drive release from 1993.
The diverging routes of *OutRun* at least are retained here, however, the Ferrari has been replaced with an awkwardly styled rocket car... from the future.

OutRunners
This is one of the better *OutRun* sequels, the coin-op version featuring linked cabinets for multiplayer racing and the System Multi 32 board powering late sprite-based graphics drawn in a style similar to Yu Suzuki's 1988 classic, *Power Drift*.

OutRun 2 / OutRun 2 SP
This great game had a full Ferrari licence with eight drivable supercars, as well as new game modes and awesome Chihiro-powered 3D graphics. It was the first real sequel to *OutRun*, and it had only taken 17 years to arrive.

Sega Ages 2500 Vol. 13: OutRun
This is in part a sequel to *OutRun* and in part a conversion of the original game, in dull polygonal 3D graphics. A new Arrange mode means you needed to overtake rivals within each stage, and then stay ahead of them until the end of your drive.

OutRun 2006: Coast 2 Coast
This is the homecoming of *OutRun 2* and *SP*, collecting fine Xbox, PS2, PSP and PC conversions of the arcades together with additional console/computer-exclusive material. Essential.

explaining that the emphasis on the scenery was deliberate: "I wanted to make a game where you could enjoy magnificent changing scenery and landscapes while driving, and really get a nice sensation from playing it – not a stoic racing style of play."

From the use of a roofless Testarossa and the choice of Coconut Beach as the game's first stage, to the names of the soundtrack selections (breeze, wave, shower) and the various pastel shades used to draw the sky, *OutRun* feels almost tangibly fresh; the perfect game for summer. We mention this to Suzuki, quietly hoping we haven't just perceived the experience horribly wrong all these years. "Yes, that's correct," he nods, to our relief. "I wanted to make stages where you could smell the fresh fragrance of new leaves and flowers, like in the green meadows of Switzerland, so I'm happy that you were able to sense that."

For such a cohesive, finely crafted game, it's surprising to hear that the team behind *OutRun* was very much a randomly assembled group of individuals from within Sega. "The team consisted of four programmers, five graphics designers and one sound creator," Suzuki says, "and we had the [coin-op] cabinet made by commissioning another team. The game development team was made up of people who happened to be available at the time, so I wasn't able to assemble the team according to my wishes. I wrote all of the important planning and programming parts myself; I don't think anything was really influenced by the development staff. I recall the bulk of development work taking between eight and ten months to complete. However, during those eight to ten months I was almost living at Sega," he laughs.

Although the other programmers and graphics designers working on *OutRun* appear, according to Suzuki, to have had scant influence on shaping the game, one man – Hiroshi Kawaguchi (the artist formerly known as Hiroshi Miyauchi) – had a tremendous effect on what has become one of the most highly regarded aspects of *OutRun*'s production: its music. Kawaguchi joined Sega as a programmer in 1984, coding alongside Yuji Naka on the SG-1000 game *Girl's Garden* while writing music purely as a hobby outside of work. Suzuki heard some of Kawaguchi's tunes and was so impressed that he commissioned him to produce the soundtrack for *Hang-On*, after which Kawaguchi quit his role as a programmer and became a full-time in-house composer at Sega.

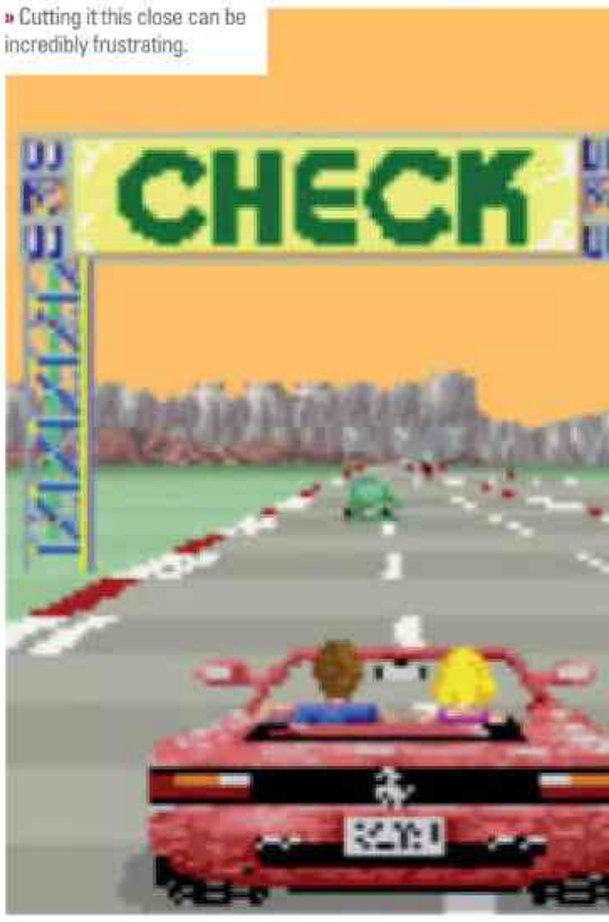
Yu Suzuki, himself a guitarist, had specific requests of Kawaguchi for his *OutRun* assignment: "During the planning stage I explained in detail to the sound engineer what type of tunes were needed. I told him that basically I wanted eight-beat rock rhythms at a tempo of 150bpm. I remember selecting a number of tunes to be used as points of reference. In those days we couldn't use samplers or PCM sound sources, so the timbre of the tunes was a synthesizer creation, which led to us having some difficulty when attempting to trim data quantities for playback of the tunes. I remember wanting some guitars and voices in the soundtrack, but it was impossible to achieve with the technology of the time, so I ultimately had to give up."

The final soundtrack represents one of the finest, enduring examples of Japanese videogame music. *OutRun* offers players a choice of three tunes – *Passing Breeze*, *Magical Sound Shower* and *Splash Wave* – via a mock car-stereo screen before the action begins. It's a concise collection of aurally luxurious numbers, each upbeat and catchy to the point where players would anticipate every subsequent bar. Somehow these tunes fit *OutRun*'s graphics perfectly, and they even seem to be in tune with the feel of the Testarossa's acceleration and handling. This is explained in part by Yu Suzuki's balanced commitment to *OutRun*'s sonic, visual and responsive aspects – "I couldn't think of the game and music as detached, separate things," he tells us – but there's also the fact that Hiroshi Kawaguchi, after working with Suzuki to deliver the excellent *Hang-On* music, was beginning to understand Suzuki's wishes and his way of thinking. We ask Yu Suzuki to reveal his favourite *OutRun* cut and he responds without any hesitation: "*Magical Sound Shower*."

Aware of all five senses (he has even contemplated the potential for games that challenge players' sense of smell), Yu Suzuki wanted to make *OutRun* a tactile experience – not just something to appeal to the eyes and ears. Hence the cabinet designs he commissioned, which were early examples of coin-op setups capable of delivering force feedback to players at appropriate moments, such as whenever the Testarossa crashed into a roadside signpost. There were four flavours of *OutRun* cab – Deluxe and Standard moving types, an upright with a force feedback wheel only, and a cockpit version without any such movement. The appeal of the jolting DX and SD versions was overwhelming, and after their initial trial runs non-feedback cabinets became relatively rare in Japan. Regardless of the presence/absence of moving parts in these prestigious cabinets, all of them used Nanao-brand monitors. It was essential that *OutRun*'s super-quick sprite-scaling and undulating roads were displayed on the best possible screens, and it was fortuitous that these cabinets were the last wave of Sega machines to use Nanao monitors. As part of a cost-cutting exercise, subsequent Sega coin-ops would use lower-spec Samsung displays – while the Nanao screens would stay bright forever, the later Samsung monitors were prone to screen-burn and visual signs of ageing.

The *OutRun* arcade machines had an unexpected effect on the crowds of players who used to hang out at Japan's game centres; no previous driving game had inspired such dedication. And players went to extraordinary lengths in the pursuit of high scores. Around 1988 it was common in Japan to find *OutRun* machines with broken gearsticks: the so-called 'gear ga-cha' trick – where opportune gear-down/gear-up shifts would be rewarded with a prolonged white-exhaust speed boost – was published in Japan's then-widely read *Gamest* magazine, along with a photo-led guide to explain the intricacies of the move. Arguably the most aggressive of OutRunners were not playing in the intended spirit of the game, but such determined play helped to establish *OutRun* as a phenomenon in the arcades, as well as a commercial success that covered Yu Suzuki's travel expenses many times over.

Yu Suzuki has always been blessed with a clear vision of what he wants, even if – as in the case of the unfinished *Shenmue* saga – he hasn't always managed to get it. But with *OutRun*, Suzuki's vision was realised as perfectly as could have been hoped for, leaving players and its designer and programmer with a supreme, satisfying experience born out of red metal, pastel skies and accelerating away towards the horizon. We'll leave Yu Suzuki with the final word; he deserves it: "*OutRun*'s concept was not about frantically racing to just barely take first place. It's about giving a ride to a beautiful woman, who sits at your side, and driving around in a luxurious car with just one hand on the steering wheel, taking first place in the race by a wide margin – and with time to spare."



» Cutting it this close can be incredibly frustrating.

Yu Suzuki Timeline

HANG-ON
(released 1985; Arcade version pictured)

SPACE HARRIER
(1985; GBA version pictured)

AFTER BURNER II
(1987; Arcade version pictured)

POWER DRIFT
(1988; Arcade version pictured)

VIRTUA RACING
(1992; Arcade version pictured)

VIRTUA COP
(1994; PS2 version pictured)

VIRTUA FIGHTER 2
(1994; Arcade version pictured)

"The main impetus behind OutRun's creation was my love of a film called The Cannonball Run. I thought it would be good to make a game like that"

YU SUZUKI ON HIS FASCINATION WITH THE BURT REYNOLDS FLICK

» The open road, a blonde gal at your side, *Magical Sound Shower* playing. Thanks, Yu.

DEVELOPER HIGHLIGHTS

SPACE HARRIER
SYSTEM: ARCADE
YEAR: 1985

VIRTUA FIGHTER 2 (PICTURED)
SYSTEMS: ARCADE/SEGA SATURN
YEAR: 1995

SHENMUE
SYSTEM: DREAMCAST
YEAR: 1999

» Decisions, decisions.

» *OutRun*'s hilly tracks and undulating scenery add to the great sense of speed.

FERRARI F355 CHALLENGE (1999; PS2 version pictured)

SHENMUE (1999; Dreamcast version pictured)

SHENMUE II (2001; Dreamcast version pictured)

PROPELLER ARENA (unreleased; Dreamcast version pictured)

VIRTUA FIGHTER 4 (2001; PS2 version pictured)

OUTRUN 2 (2003; Xbox version pictured)

PSY-PHI (2006; Arcade version pictured)

SEGA RACE TV (2008; Arcade version pictured)

FROM THE ARCHIVES

RETRO GAMER DIGS UP THE FILES OF THE CLASSIC COMPANIES OF OLD

Atari Inc

Formed by two engineers, Atari rose to define the early games industry. However, its rapid expansion hid the looming threat of bankruptcy that defined its early days, right through to the corporate overindulgence and personality clashes that oversaw its ultimate downfall

Atari's origins go back to Ampex and a little-remembered division called Videofile. A document storage and retrieval system that used videotape and television displays to search for and reproduce documents, it was capable of recalling a full page out of the phone book and printing it accurately. An analogue engineer by the name of Ted Dabney had been working in the 'Input/Output' group at Videofile, responsible for the cameras and printers used to record and later print out documents, when he found himself with a new office mate. Just out of college, the young Nolan Bushnell had moved out to California from Utah after getting an entry-level job at Ampex.

Skill and personality-wise the two couldn't have been more different. According to their boss, Ed DeBenedeti: "Nolan was the dreamer and Ted was the plodder. Ted's engineering work and ideas were conservative perhaps in the extreme. Nolan and later interns Al [Alcorn] and Steve [Bristow] were brilliant, inexperienced enough that they had no idea of what one could not do."

In a sense, Ted's experienced approach to engineering would serve well to give Nolan's inexperience and forward-looking manner a solid foundation as the two embarked on a side project together. Already enjoying daily games of Go in the office on Ted's custom-built board, Nolan talked about wanting to pursue bringing computer games to the arcade environment. Tapping the more experienced Ted, he began partnering with him on trying to make the dream a reality. According to Ted: "He took me off to Stanford to see [*Spacewar!*] so I could help him come up with ways to do such a thing."

The original plan was to bring the experience direct to the arcade via a PDP or comparable minicomputer, and a third partner with programming experience, Larry Bryan, was brought in to that end. It turned out to be a short partnership, however, when this approach was quickly found to be cost prohibitive, but they did get a name for their engineering group out of it – Syzygy Engineering. If this plan for an electronic arcade game worked out, the two planned to have Syzygy be a contract-engineering firm for the arcade industry.

When it was decided to move to a non-general purpose format – or 'state machine', where the game is comprised of zero code but rather hardwired through chip logic – it became Ted's turn to do the heavy lifting. He designed all the circuitry to put a spot on a modified television screen and move it around, and Nolan shopped it around for someone who may be interested in funding the development of a final product, as well as manufacturing and distribution. Finding closed doors everywhere he looked, and little interest in the arcade industry mecca of Chicago, he finally found a coin-op company locally that was interested. Nutting Associates had previous successes with electro-mechanical games such as

INSTANT EXPERT

Atari Inc was founded on 28 June 1972 but technically began in 1969 as a partnership between Nolan Bushnell and Ted Dabney called Syzygy Engineering.

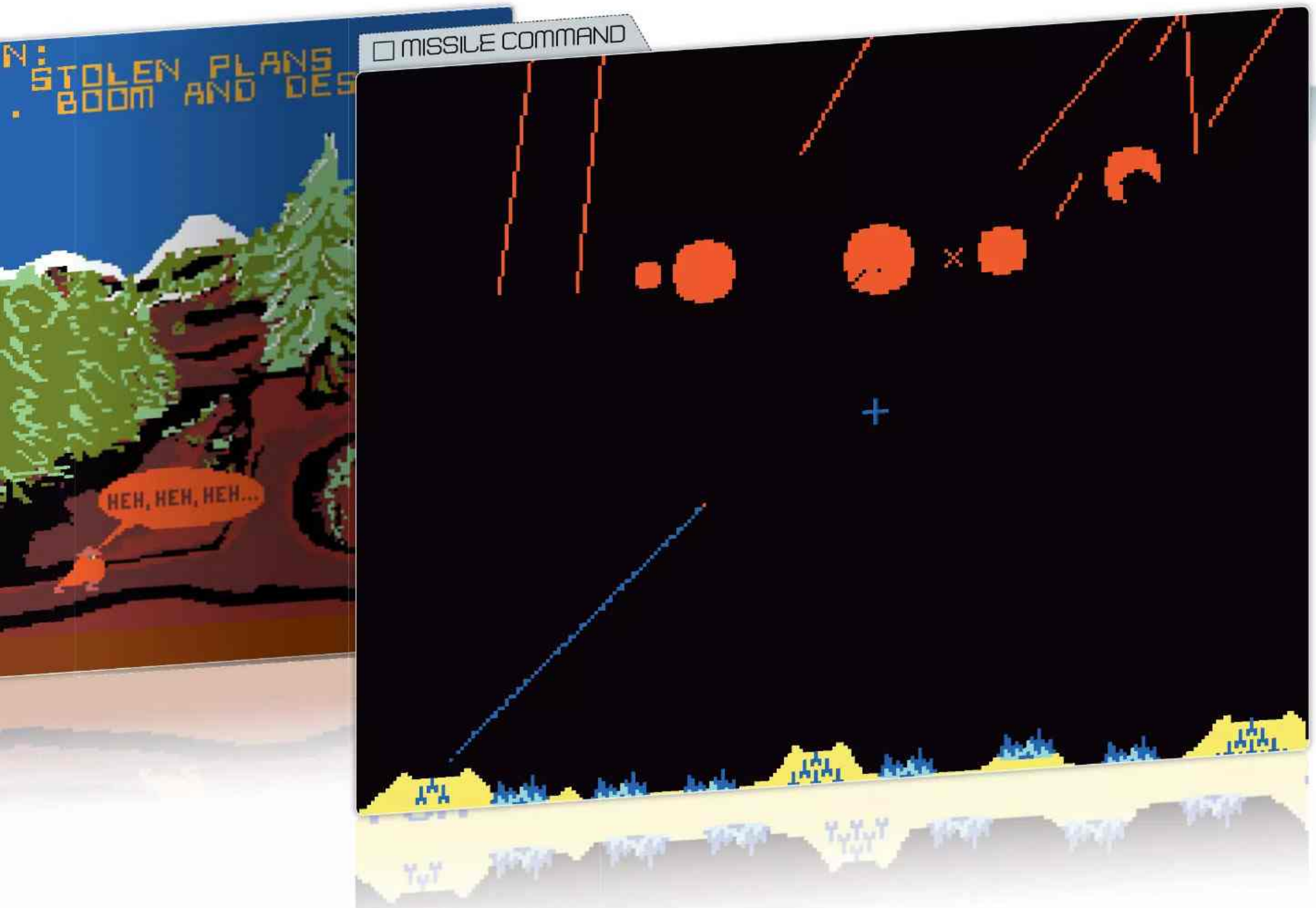
Atari's first arcade game was *Pong* in 1972. Its first consumer product was a home version of *Pong* for Sears in 1975.

The Video Computer System (VCS), better known as the Atari 2600, began its life in August of 1975 and was released on 14 October 1977.

Warner Communications bought Atari in 1976 for an estimated $32 million. It gave away half of it in 1984 for no money – just promissory stock.

Atari's top game properties are *Pong, Breakout, Asteroids, Centipede, Battlezone, Missile Command* and *Tempest*.

Atari affected the popular culture of the early Eighties to such a degree that it became synonymous with high technology. It even affected US politics, as the term 'Atari Democrat' was created to describe Democrats who supported the development of high-tech industries to stimulate the US economy of the time.



“He definitely had no ideas about TV games of any sort”

TED DABNEY ON NOLAN'S VISION WHEN THEY STARTED WORKING TOGETHER

Computer Quiz and saw the potential of this new format. Hiring Nolan as lead engineer to finish adapting Ted's work into a game while performing other duties at the company, Nutting became the future of the industry for a short time.

Having talked Ted into leaving Ampex and joining him at Nutting, by the end of development Nolan was itching to have more input on the business side of things. The two left Nutting by the spring of 1972 and decided to make Syzygy Engineering their main source of income.

Funding the startup with money from Nutting's purchase of *Computer Space*, and subsidising daily operations with a coin route, Nolan looked to get their first contract. Their first client was Bally, which contracted them to produce pinball playfields and, more importantly, an electronic driving game. Nolan hired former Ampex intern Al Alcorn to work on the proposed game, and allowed him to get acclimated to their video circuitry from *Computer Space*. Nolan had seen a demonstration of the first videogame console, the Magnavox Odyssey, that past May, and decided to have Al do an arcade version of its tennis game. By the time Al was done in August of 1972, Nolan was outvoted two to one to make Al's warm-up game, *Pong*, Syzygy's actual game for Bally.

It was during this time that Atari got its now-legendary name. When looking to formally incorporate Syzygy Engineering, it was found that several other companies were already using the name. Giving the clerk a list of names based on moves from Go, the clerk picked Atari, not knowing that he would be choosing the name of the company that would define electronic entertainment for years to come. On 27 June 1972, Atari Inc was officially born. Nolan and Ted decided to keep the Syzygy name for the engineering portion of their venture, and use Atari for their outward-facing business activities.

A surprise hit

After putting several test cabinets of *Pong* out into the wild – most notably one at Andy Capp's Tavern that sat right next to a *Computer Space* unit – a funny thing happened. *Pong* was a big success, drawing in far more money than the *Computer Space* machines were, to the extent that the Atari staff were afraid that when they reported back to Bally on how the test run was doing, Bally wouldn't believe them. Wary of this, they under-reported the earnings numbers, and Bally still thought they were exaggerating.

With Bally stalling on accepting the game and looking to possibly pass it off to its subsidiary, Midway Manufacturing, and Atari knowing how well the game was actually doing, Nolan, Ted and Al had a decision to make: either let *Pong* sit in limbo to maybe be rejected altogether, or look to go into manufacturing for themselves. They chose the latter, and Ted concocted a plan that ▶

BY THE NUMBERS

$40 million The amount of profit generated by Atari as its golden age began in 1977, the year it released the hugely successful Atari 2600.

$539 million The amount it lost in 1983, as the industry's crash was under way.

2 The number of competitors Atari had in video arcade games in 1972.

25 The number of competitors by 1974.

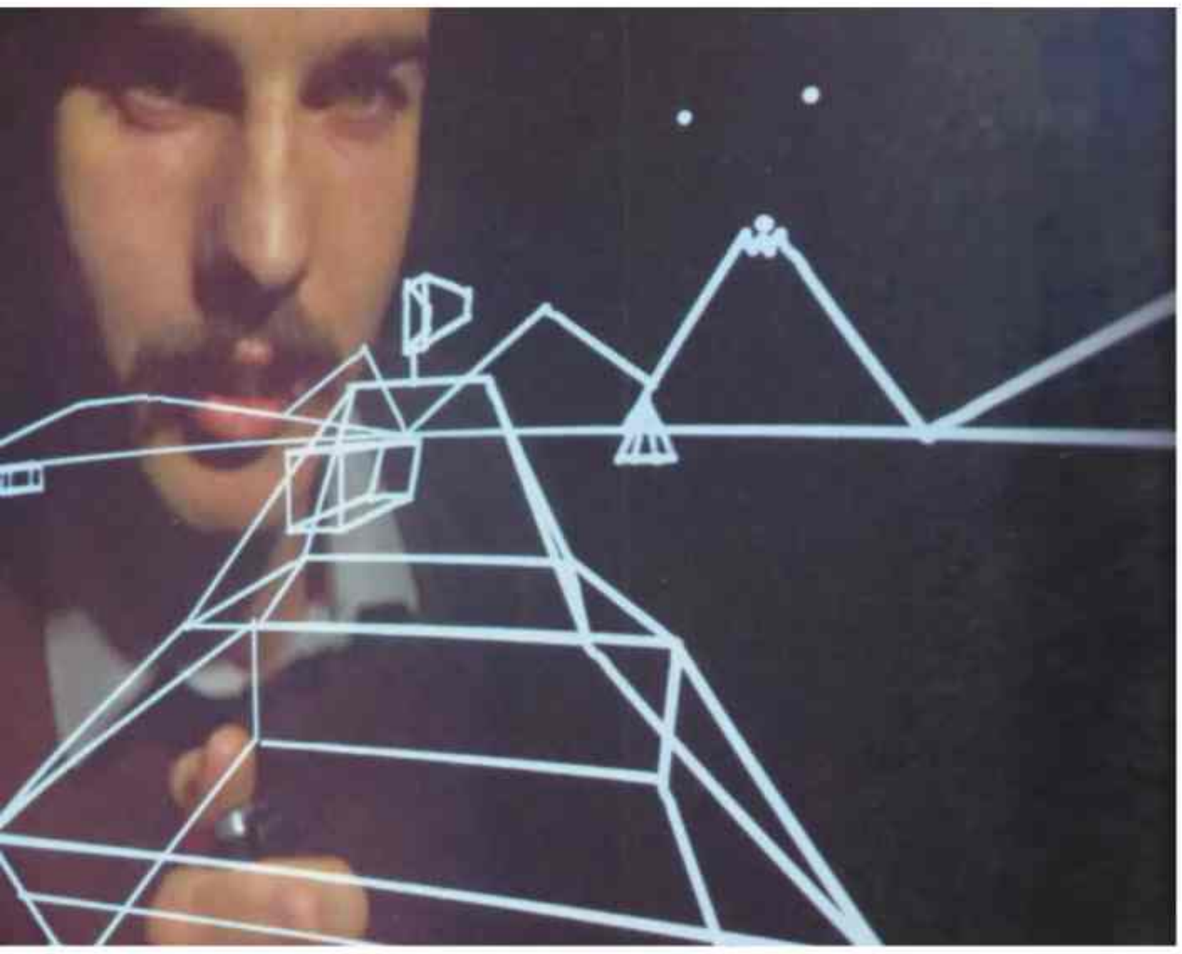
$98.95 The cost of Atari's first home console, *Pong*, in 1975.

$189 The cost of the Atari 2600 at launch.

1 The number of manufacturers making games for the Atari 2600 at its 1977 release. Of course, it was just Atari itself, although third-parties would quickly appear.

145 The number of manufacturers making games for the 2600 worldwide at the time of the crash.

5,000 The number of shares allegedly sold by Ray Kassar based on insider knowledge of Atari's performance.



TIMELINE

1969 SYZYGY PARTNERSHIP FORMED

1971 *COMPUTER SPACE* RELEASED BY NUTTING ASSOCIATES

1972 ATARI INC FORMED. BOARD OF DIRECTORS ARE NOLAN K BUSHNELL, S FRED DABNEY (TED DABNEY), AND THEIR WIVES PAULA N BUSHNELL AND JOAN M DABNEY

1972 THE FIRST TEN PRODUCTION *PONG* UNITS SHIP

1973 TED DABNEY FORCED TO QUIT, BUT REMAINS ON THE BOARD. ATARI BEGINS RELATIONSHIP WITH CYAN ENGINEERING

1973 KEE GAMES IS FORMED AS A 'COMPETITOR'. WHILE HAVING SEPARATE MANAGEMENT AND ENGINEERS, THEY SHARE THE SAME ASSEMBLY LINE

1974 *GRAN TRAK 10* RELEASED. LAYOFFS ENSUE

Nolan send a carefully crafted letter to Bally, suggesting that it officially reject *Pong* so that Atari could develop a new game for it. The letter worked, and Atari became a full design and manufacturing arcade company.

New horizons

From there the growth was explosive, with Nolan and Ted hiring people off the streets to fill the manufacturing needs, and Nolan hiring more engineers and management to help with the growth. Tension began to develop between Nolan and Ted on how the company should be running, however, and Nolan decided that there wasn't room for two heads – a fact that became obvious to Ted when Nolan hired someone to come in and help restructure the business and employee roles. When they asked Ted what he did at Atari, he knew his time was up; he was forced out of the company, with management firmly in Nolan's hands, as Atari began its 'Innovative Leisure' period.

By continuing to pump out new games based on sports themes while doing engineering research for an eventual move into the consumer market, Nolan looked to stay ahead of the game. As Al Alcorn relates: "Nolan didn't want to define us as the best coin-op game designer and manufacturer; instead he focused broadly on the entertainment business. We were creating new, disruptive products in the leisure industry. Nolan figured people would spend more money on what they want, not what they need." But things soon took their toll on the fledgling company.

Nolan had made some bad hiring decisions for the financial management portion of the company, and it soon needed to lay off employees. To make matters worse, it started facing intense competition from others entering the videogame market, including old industry hands like Bally and Chicago Coin, and new companies like Allied Leisure. Already competing for a spot at the well-established coin-op distribution table, Nolan came up with the idea to create a 'competitor' to increase the cash flow of the company. It would have its own building, exhibit on its own at the industry shows, and have its own purchasing, sales and engineering group, which would include another former Ampex intern, Steve Bristow, but all its manufacturing would be done on the Atari assembly line. This company, Kee Games, could clone Atari titles, allowing the company to sell them 'exclusively' to two distributors at once.

The wheels come off

Financial disaster struck in the form of *Gran Trak 10*. The game was so badly engineered that they started coming back to Atari in droves, forcing Al Alcorn to come out of his sabbatical and redesign them, and forcing an even more lengthy delay to this already costly game. Then, on top of that, an accounting error set the selling price of each unit to $995, when it cost $1,095 to manufacture it in the first place. It resulted in pushing Atari even further towards bankruptcy, and the company ended up losing half a million dollars between 1973 and 1974. By the end of 1974, Atari began to fully merge Kee into its parent and offloaded its Japanese operation to Nakamura Manufacturing Co, better known as Namco.

Things started looking a bit better in 1975 as Kee's management entrenched itself at Atari. Kee president and Nolan's next door neighbour Joe Keenan became president of Atari; Gill Williams became VP of manufacturing, helping to smooth out issues there; and Kee's lead engineer, Steve Bristow, became VP of engineering. Along with Steve came top engineering talent and future stars like Lyle Rains, who, together with Steve, had created the blockbuster *Tank* at Kee. Several arcade classics would be released in 1975 that would go on to become more known for their Atari 2600 versions but served the ultimate goal of helping Atari get back on track: *Anti-Aircraft*, *Jet Fighter*, and the multiplayer *Indy 800*. The biggest development, though, was the fulfilment

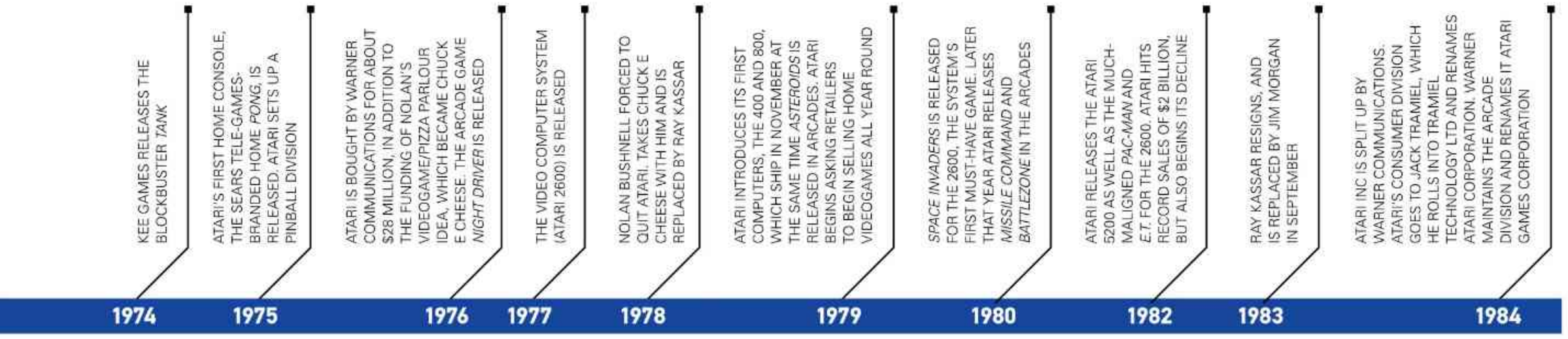
WHERE ARE THEY NOW?

Nolan Bushnell
After leaving Atari, Nolan headed his Chuck E Cheese Pizza Time Theatre until facing bankruptcy. Funding several start-ups under Catalyst Technologies in the Eighties and briefly returning to video arcade games under Sente, he ran a string of entertainment companies including PlayNet and uWink, which eventually closed due to poor market performance. He is currently partnered in Anti-Aging Games and is an advisor to the current owner of the Atari brand, Atari SA (formerly Infogrames).

Ted Dabney
After leaving Atari Inc in 1973, Ted worked for arcade company Meadows for a time as well as several other non-arcade engineering jobs. He even briefly worked for his ex-partner again when he created the pizza number callout system for the early Chuck E Cheese, as well as the Chuck E Cheese-branded *Isaac Asimov Presents Super Quiz* arcade game in the late Seventies. He's currently enjoying retirement while reacting to the recent interest in his involvement in early videogame history with surprise, wonder and gracious interviews.

Steve Bristow
Since leaving Atari in 1984 after more than a decade, Steve has worked as an engineer at various communications firms. Sadly, the Atari pioneer passed away in early 2015.

Al Alcorn
After leaving Atari Inc in 1983, he became an Apple Fellow in 1986 before moving through a string of engineering management positions at various entertainment companies in the Nineties and early 2000s. He's currently VP of engineering at uGetit, a mobile social gaming firm that combines gaming with 'social shopping'. Former Atari employee Roger Hector also joins him there.


1974
KEE GAMES RELEASES THE BLOCKBUSTER *TANK*
1975
ATARI'S FIRST HOME CONSOLE, THE SEARS TELE-GAMES-BRANDED HOME *PONG*, IS RELEASED. ATARI SETS UP A PINBALL DIVISION
1976
ATARI IS BOUGHT BY WARNER COMMUNICATIONS FOR ABOUT $28 MILLION, IN ADDITION TO THE FUNDING OF NOLAN'S VIDEOGAME/PIZZA PARLOUR IDEA, WHICH BECAME CHUCK E CHEESE. THE ARCADE GAME *NIGHT DRIVER* IS RELEASED
1977
THE VIDEO COMPUTER SYSTEM (ATARI 2600) IS RELEASED
1978
NOLAN BUSHNELL FORCED TO QUIT ATARI. TAKES CHUCK E CHEESE WITH HIM AND IS REPLACED BY RAY KASSAR
1979
ATARI INTRODUCES ITS FIRST COMPUTERS, THE 400 AND 800, WHICH SHIP IN NOVEMBER AT THE SAME TIME *ASTEROIDS* IS RELEASED IN ARCADES. ATARI BEGINS ASKING RETAILERS TO BEGIN SELLING HOME VIDEOGAMES ALL YEAR ROUND
1980
SPACE INVADERS IS RELEASED FOR THE 2600, THE SYSTEM'S FIRST MUST-HAVE GAME. LATER THAT YEAR ATARI RELEASES *MISSILE COMMAND* AND *BATTLEZONE* IN THE ARCADES
1982
ATARI RELEASES THE ATARI 5200 AS WELL AS THE MUCH-MALIGNED *PAC-MAN* AND *E.T.* FOR THE 2600. ATARI HITS RECORD SALES OF $2 BILLION, BUT ALSO BEGINS ITS DECLINE
1983
RAY KASSAR RESIGNS, AND IS REPLACED BY JIM MORGAN IN SEPTEMBER
1984
ATARI INC IS SPLIT UP BY WARNER COMMUNICATIONS. ATARI'S CONSUMER DIVISION GOES TO JACK TRAMIEL, WHICH HE ROLLS INTO TRAMIEL TECHNOLOGY LTD AND RENAMES ATARI CORPORATION. WARNER MAINTAINS THE ARCADE DIVISION AND RENAMES IT ATARI GAMES CORPORATION

of Nolan's wish for Atari to enter the consumer arena.

Homecoming

Al Alcorn and several engineers had been working on bringing *Pong* to homes. The move to the consumer market meant shrinking the large logic-based arcade board to a small integrated circuit, for which a partnership with chip manufacturer Synertek and its IC designer Jay Miner was formed. The end result was a product that put Atari on the map in the consumer market when it released through Sears in time for Christmas 1975. The research and development firm Cyan was also busy during *Pong*'s home release, working on a microprocessor-based home console that had the potential to more than make up for the *Gran Trak 10* fiasco.

Still realising that it wasn't enough to completely save the company and expand operations like he wanted to, Nolan began looking for more investors in Atari, and eventually, an actual buyer. As 1976 began, the buyer appeared in the form of Warner Communications. Warner had been on a buying spree to expand its operations, and the acquisition of an expanding videogame firm like Atari fit nicely into its plans. The deal was signed in October 1976, officially making Atari a Warner subsidiary.

Under Warner, development of Atari's consumer line began to blossom, the most prolific aspect of which was Cyan's microprocessor-based game console. First codenamed Stella and then officially named the Video Computer System (CX-2600), it was released in 1977 and proved to be the path to true greatness for the company when it became an icon of the videogame industry in the early Eighties. It sold well that first season in 1977 but proved financially harmful to Atari the following year when manufacturing delays caused a shortage of the console for the 1978 Christmas season. As in the arcade industry years before, Atari was soon joined by competitors eating up the new console market – Bally with its Professional Arcade, Magnavox and Philips with the Odyssey[2], RCA with the Studio II, and programmable console pioneer Fairchild with its Channel F a year before Atari's console. Atari needed to separate the VCS from the pack.

Also contributing to Atari's familiar financial problems for 1978 were a lacklustre arcade line-up, such as *Sky Raider, Ultra Tank* and *Smokey Joe.* To make matters worse, there was tension between Nolan and Warner Communications. Nolan had been accused of being a lax CEO since the purchase, almost "checking out" of the much-needed daily running of the company, and by his own admission that was the case. Consequently, it left more room for Warner and its installed executives to flex their muscles, such as Raymond Kassar,

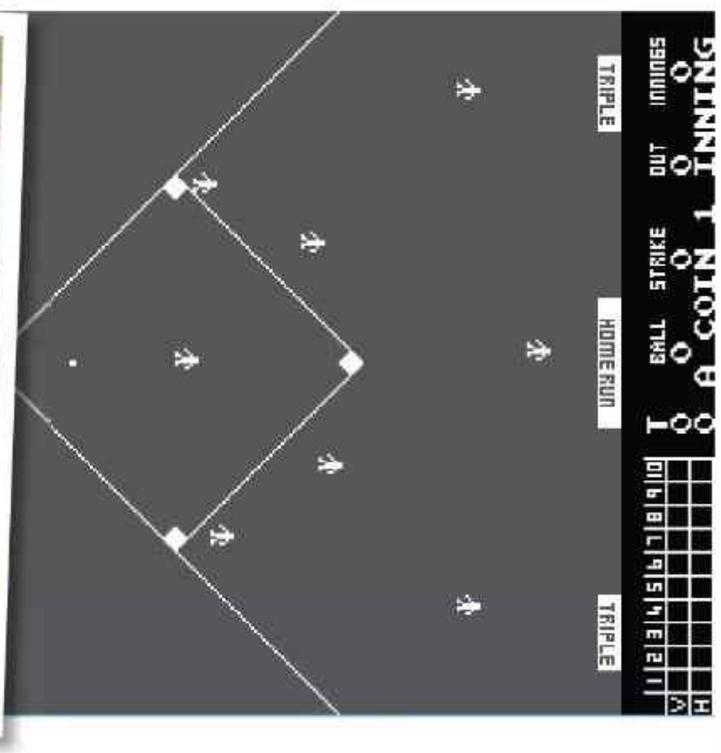
» Nolan Bushnell inspecting rows of *Pong* units ready to ship out in 1973.

> **"It was just business, nothing personal"**
>
> NOLAN BUSHNELL ON FORCING OUT ATARI CO-FOUNDER TED DABNEY

the head of the consumer division. It didn't help matters that Nolan began butting heads with Warner on issues like the future of the pinball division, or even the future of the VCS.

By the autumn of 1978, Nolan had crossed the line by trying to hold meetings in secret without Warner staff. Warner put Nolan out to pasture after a reorganisation plan and, like Ted years before, he was left with no recourse but to quit that December. Ray Kassar was now left in ▶

» Enjoying a round of *Battlezone* during its development are: (left to right) Lyle Rains, Dona Bailey, Ed Rotberg, Jeff Boscole and Owen Rubin (seated).



HOLOGAMES

As the electronic toys craze hit in the late Seventies and early Eighties, Atari had a brief foray into its own handheld electronic devices and board games under its new electronic games division. Starting in 1978, Atari released *Touch Me*, a handheld game based on its own arcade game of the same name, which competed with and lost against a game from Milton Bradley inspired by *Touch Me, Simon*. Atari planned to follow up with handheld games based on arcade properties like *Breakout* and the licensed *Space Invaders*, and even planned advanced tabletop hologram-based products like the Atari Cosmos and Atari Spector. Alas, it was never to be. By the early Eighties, the electronic games market was lagging in the US and Atari shut down the division. Atari not only lost some advanced games in the process, but it lost the company's third employee, Al Alcorn, who had been heading the Cosmos project and quit shortly after.

SIX OF THE BEST

Asteroids [1979]
The classic space shooter that influenced a generation, and it's still fun to play. While most will have to settle for playing this game on pixelated technology, nothing compares to playing in its original crisp vector monitor format.

Centipede [1980]
Another innovative game, *Centipede* improves on the bug theme initiated by *Galaxian*. Set in a dynamically changing garden playfield and complete with vibrant colour scheme, this top-down shooter proved a smash hit for Atari.

Warlords [1980]
Still one of the best multiplayer video arcade games of all time, its home port for the 2600 was just as fun and one of the only times you'll hook up four paddles. The arcade version includes a breathtaking 3D cut-out reflected backfield.

Tempest [1980]
Atari's first colour vector game, this fast-paced shooter that has you rotating around geometric shapes is again one that just looks best on a vector monitor. A capable home version wasn't released until *Tempest 2000* for the Jaguar.

Missile Command [1980]
Global thermonuclear war, Atari style. The home ports dumbed down the gameplay for use with a single joystick and button. Accordingly, Atari engineer Dan Kramer was inspired to design a home version of the arcade trackball.

Tank [1974]
A classic that many will never have a chance to play, as it's a discrete logic game that therefore cannot be emulated. It's satisfying using dual sticks to manoeuvre your tanks through a maze while you attempt to blast your opponent.

ONE TO AVOID

Slot Racers (2600) [1978]
This, Warren Robinett's warm-up game for the much more successful *Adventure*, is Atari on autopilot. While an original concept, it was done better in later coin-ops like *Spectar* and *Targ*. 2600 games are not known for their inspired graphics, but the cars don't even look like cars.

» Two shirts designed by Dan Kramer for internal use at Atari to celebrate the release of his Atari 5200 Trak-Ball.

charge and began heading what many consider the golden age of the company, if not the entire Atari brand. Not without a little speed bump to start out with, though.

Under new management

Shortly after coming to the company, Ray had begun bumping heads with some of the Video Computer System programmers, calling them "high-strung prima donnas" in an off-the-record portion of an interview with the *San Jose Mercury News* that ended up getting published. A meeting designed to be a pep talk in early 1979 proved to be the last straw for some, as he managed to alienate even more.

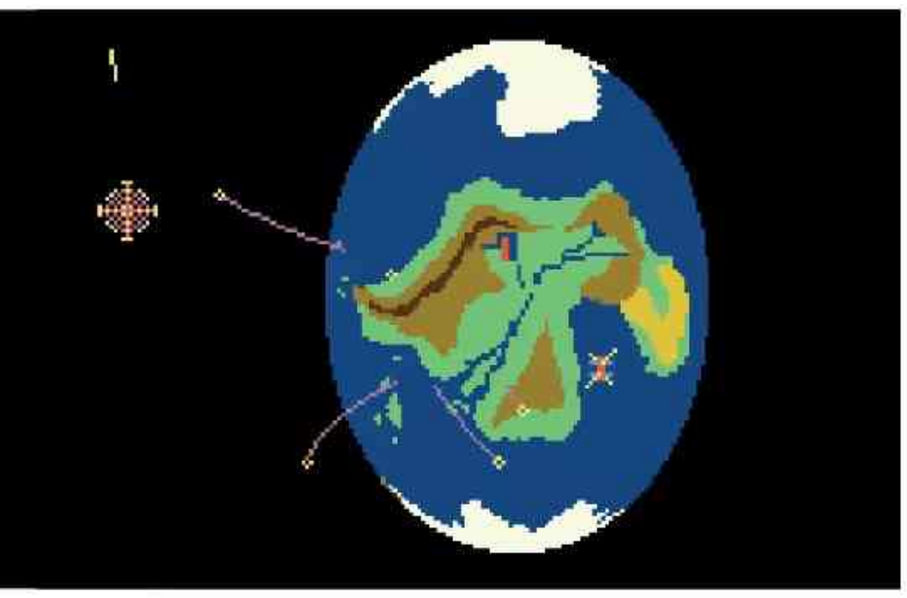
VCS and Atari 400/800 engineer Joe Decuir related: "Ray called a meeting of the entire engineering team, coin-op and consumer – a bit of 'blah blah', and then he started talking about what we were going to do. He was excited about the [400 and 800] computer. He said we were going to sell them in designer colours so that women would buy them, and that we would also have home decorating software. A number of women I knew in engineering decided to resign because of this. One of the VCS programmers asked him how he was going to deal with the creative talent – the game designers. He said he knew about creative types from dealing with towel designers at Burlington Mills, his previous company. A core of programmers were disgusted, and formed Activision."

Fortunately, much of the coin-op talent stayed on to thrust Atari to the front just as the market began exploding thanks to Taito's *Space Invaders*. A string of now-iconic hits were released from 1979 onwards, including *Asteroids*, *Battlezone*, *Centipede* and more. The consumer division and its Video Computer System rode the wave in 1980 after a timely licensing of *Space Invaders* for the console came to fruition. Giving the lagging console its killer app, it was soon joined by an expanding third-party market thanks to Activision, and sales really took off.

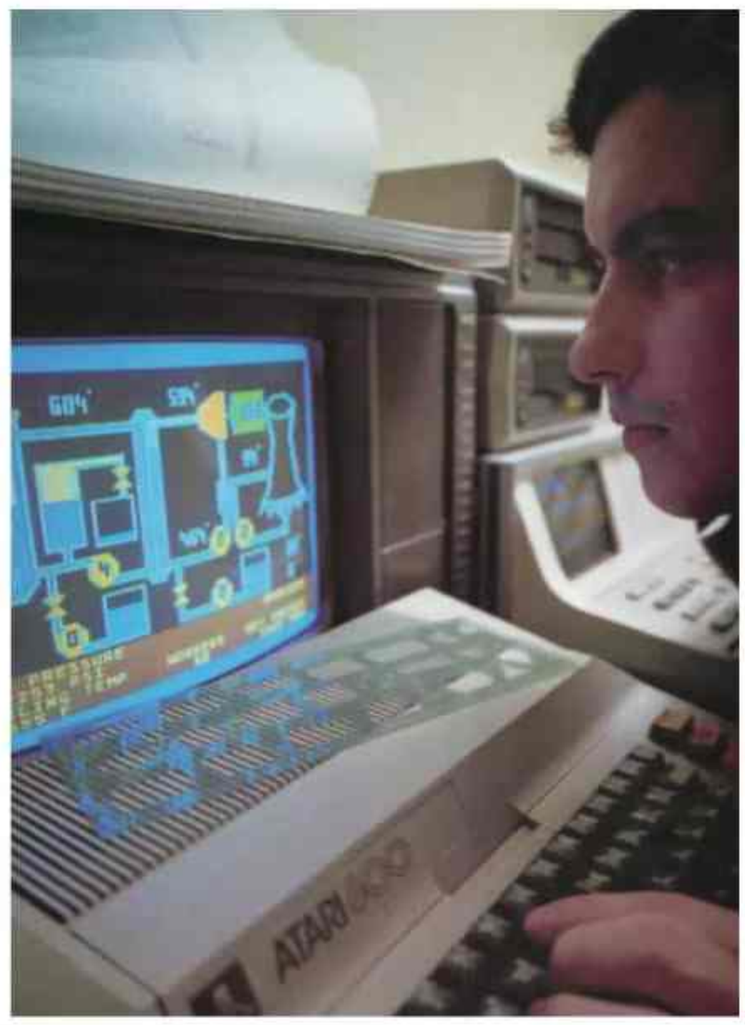
The catalyst for Atari's golden age was Warner Communications itself. As a powerhouse media company, it began leveraging its wide net of subsidiaries to add to Atari's public presence in the videogame craze of the early Eighties that it dominated. What many now take for granted or attribute to Nintendo during its Famicom/NES heyday was actually pioneered by Warner during this period. Atari-themed magazines, movie placements, toys, clothing, party favours, costumes, jewellery, storybooks, big budget cinematic commercials, collectables and more built the brand into a commercial juggernaut.

By 1982, Atari had become Warner Communications' golden goose. Comprising 80 per cent of the videogame industry, Atari was doing slightly over $2 billion in sales and producing more than half of Warner's $4 billion in revenues, and over 65 per cen of its profits. Warner saw only continued growth, and did what it could to force what should have been considered unmanageable growth, if not a bubble waiting to burst. This included frequent second-guessing of Atari management, creating a dual management. Money-losing deals such as the now-legendary *E.T.* tie-in were forced on Atari, and a string of ongoing projects that would have put the company far ahead in both consoles and computers were cancelled in favour of more incremental advancements like the Atari 5200 console and the XL series of computers. Not that some of Atari's management, such as Ray Kassar, weren't enjoying their perks; Learjets, limousines, yachts and luxury office remodelling were all on the menu.

The signs of the end for the company were beginning as it enjoyed its record profits that year. By August of 1982, warehouses around the US began piling up with unsold inventory thanks to the glut of competing consoles on the market. As Gordon Crawford, a representative of the investment group that brokered the original sale of Atari to Warner related: "At the January '82 Consumer Electronics Show there were three or four new video hardware systems and about 50 new software systems – all the warning lights went on for me. Then, at the June CES, it was worse! There were about 200 software systems. This was a business where the year before it had been



» The Atari Spector, a 'holoptic' tabletop game that never saw release.



essentially a monopoly, and now there were literally hundreds of new entrants."

Warner and Atari management became partners in a cover-up of how Atari was starting to suffer. Producing artificial reports and a trumped-up projection of earnings for the final part of 1982, members in both management groups began selling off shares to insulate themselves. The most notorious example was Ray Kassar himself, who did so shortly before the December 1982 announcement that earnings were far short of the previously announced projection. It eventually led to him being forced from his position at Atari by that summer, but the damage was already done to the industry.

The bubble bursts

Shock waves spread as investors began to question the viability of the entire videogame industry, and stock prices plummeted. Layoffs began at Atari that January, and throughout the rest of 1983 and 1984 many of these new competitors that Crawford had witnessed began closing. The videogame market crash had begun.

Atari tried to minimise its losses by starting up advanced research divisions in computing and graphics, as well as expanding its areas of consumer reach in markets like next-generation medical devices and telephone research. By September of 1983, Warner brought in James Morgan, VP of tobacco company Philip Morris, to replace Kassar and turn the company around. However, Warner began mounting heavier and heavier earnings and stock losses as Atari lost millions a day, and by winter of 1983 Warner itself was facing a hostile takeover by Australian publishing magnate Rupert Murdoch. In January of 1984, Warner brought in a firm to evaluate all its holdings and formulate a plan of action, and Atari was at the top of the list of subsidiaries that it was suggested to dump. The Murdoch takeover was averted that March after Warner bought out his stock, but the writing was already on the wall for Atari. Warner began looking for companies to buy it outright, but when it couldn't, Atari was split into pieces.

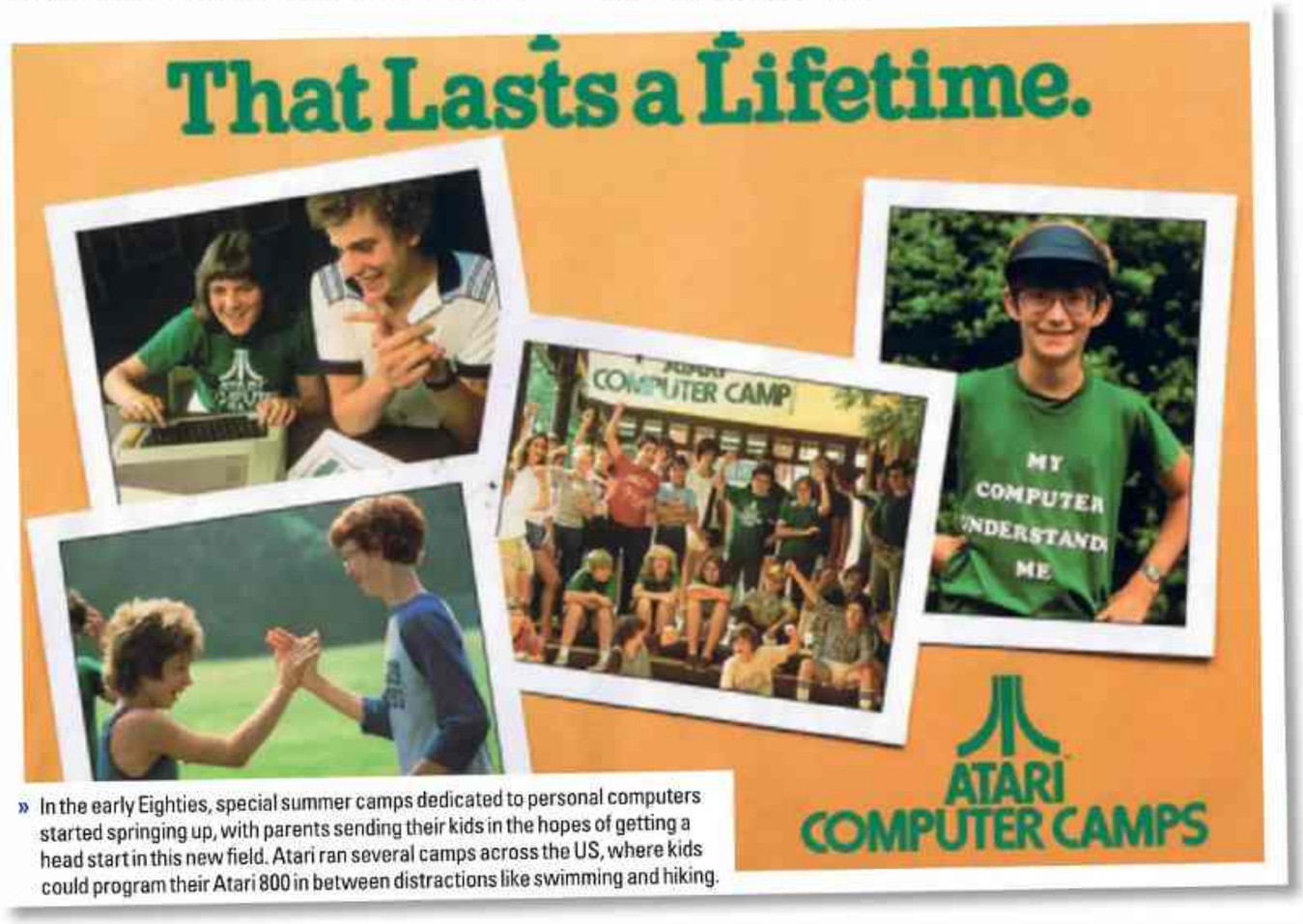
The consumer division and most of Atari's manufacturing and distribution capabilities were sold to Jack Tramiel in exchange for no money down and the taking on of most of Atari Inc's debt. Folding it into his Tramel Technologies Ltd (TTL), he renamed TTL to Atari Corporation and began a new chapter of the Atari brand in the consumer arena. The still-profitable coin division, responsible for Atari's incredibly prolific arcade output, was initially kept and reformed as Atari Games, and soon after majority ownership was sold to Namco of *Pac-Man* fame.

Much like a last-second swoop of the paddle in *Pong* to save you from your opponent scoring that winning point, the Atari brand was rescued from being completely wiped out in 1984 and would survive the crash. However, the drama, successes and failures of the well known company were to be far from over...

Special thanks: Curt Vendel, Jerry Jessop, Ted Dabney, Allan Alcorn, Steve Bristow, Owen Rubin, the Smithsonian.

THE NAMCO CONNECTION

In 1974, due to mounting losses, Atari decided to sell its fledgling Japanese operation, run by Hideyuki Nakajima, to Namco. Hideyuki agreed to stay on and run Namco's new division, which would initially release licensed Atari games before moving on to producing its own. Thus started a long partnership between the two companies. By the early Eighties it was Atari that was licensing Namco games, and these were such big hits that many are frequently regarded as Atari-created titles today, such as *Dig Dug*, *Pole Position* and *Xevious*. By February 1985, Namco purchased the Atari arcade division, by then known as Atari Games. Hideyuki was sent to oversee all of Namco's US operations, and by 1987 had pooled his own money together with other Atari Games employees to buy the company from Namco and make it employee-owned. Shortly after the purchase he created Tengen to allow Atari Games to enter the home console market. In 1994, Hideyuki and the rest of the Atari Games staff sold their company back to Warner, then known as Time Warner. Sadly, Hideyuki's long association with the Atari brand would itself end later that year when he passed away on 11 June 1994 from lung cancer.



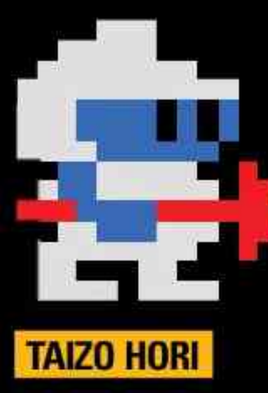
» In the early Eighties, special summer camps dedicated to personal computers started springing up, with parents sending their kids in the hopes of getting a head start in this new field. Atari ran several camps across the US, where kids could program their Atari 800 in between distractions like swimming and hiking.

KIDS DON'T TYPICALLY LIKE VEGETABLES – BUT DIG DUG PROVES THEY GET FAR MORE PUMPED UP ABOUT THEM WHEN THEY HAVE TO BEAT MONSTERS TO GET THEM. NICK THORPE LOOKS AT WHY WE STILL DIG THIS ARCADE CLASSIC...

Mining isn't an easy job. Even if you're okay with the claustrophobic tunnels and long-term health issues, there are the dangers of explosions and cave-ins. But however bad it is in the real world, it's slightly worse for our hero in *Dig Dug* – sure, he might get squashed by falling rocks or die a horrible fiery death, but he's also got to deal with the monsters that are the reason he's down there in the first place. Luckily, he's able to fight with a unique piece of weaponry. By spearing his enemies and using his trusty pump, our protagonist can inflate the bad guys until they explode!

Prior to *Dig Dug*'s 1982 arrival, Namco had already experienced success with two popular maze games. *Pac-Man*'s success requires no recap, but *Rally-X* was also popular and became a part of the company's oft-revisited heritage. Both games followed a similar formula – the player was cast in the role of prey, forced to evade predatory enemies while collecting items in a maze. *Dig Dug* took this winning formula and inverted it – in this game, the player also takes the predatory role, as the elimination of all enemies is the only requirement to pass a stage. Of course, your enemies aren't defenceless. While the player is usually in a more favourable position ▶

PIXEL PERFECT

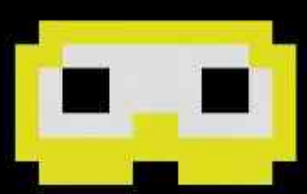

TAIZO HORI

CUCUMBER

TURNIP

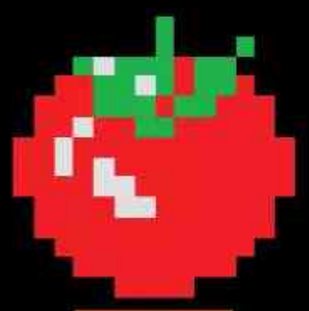
AUBERGINE

WATERMELON


POOKA (GHOST)

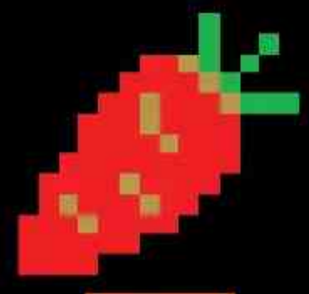
GREEN PEPPER

POOKA


TOMATO

A ROCK

FYGAR

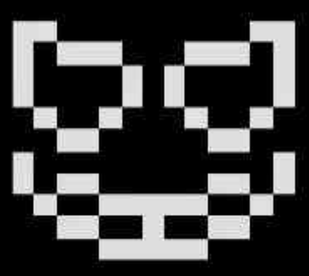

CARROT

ONION

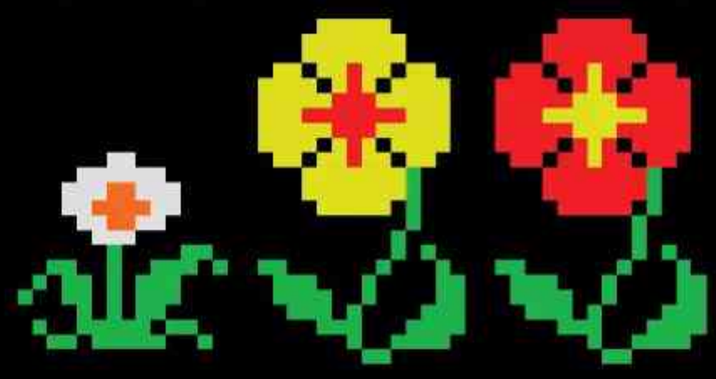
INFLATED POOKA

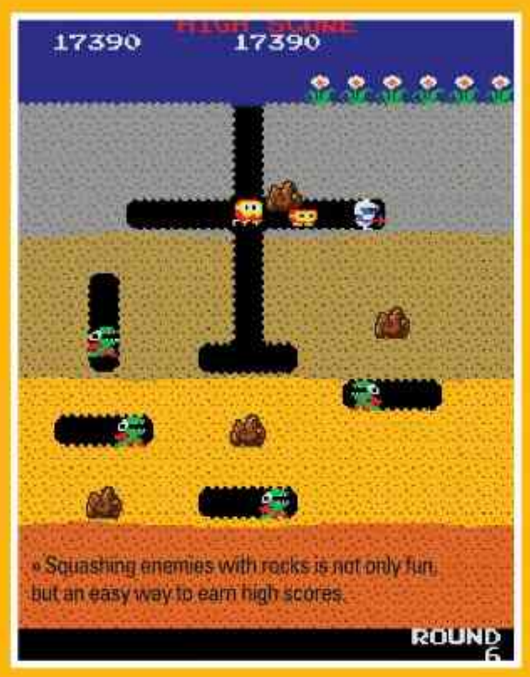
MUSHROOM

PINEAPPLE


FYGAR (GHOST)

GALAXIAN


FLOWERS



» Squashing enemies with rocks is not only fun, but an easy way to earn high scores.

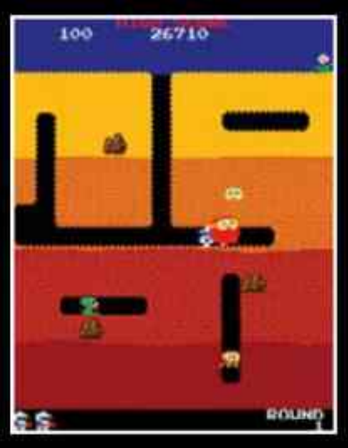
▶ in any one-on-one confrontation, the enemies are aggressive and can take advantage of their greater number.

What's more, beyond a few pre-placed caves, the player creates the mazes by digging. Because the ability to dig allows you to go anywhere, the classic maze game trap of being caught between two enemies is no problem. But while you can go anywhere, so can enemies. They're mostly content to stick to the maze, however they'll occasionally turn into ghostly forms and start travelling through the dirt, meaning that you're never truly safe from attack. Enemies travel slowly through the dirt, too, meaning that you have an incentive not to create too many tunnels.

Of course, it'd be dull to create a game in which your only goal was to hunt and kill cannon fodder relentlessly, so some elements of risk and reward were added to *Dig Dug* to keep things interesting. For a start, while the Pooka enemies are fairly unthreatening, the Fygars can shoot flames horizontally – but you'll get double the points if you attack them from a horizontal position. Rocks are potentially risky, too. Each stage hosts a few rocks buried in the dirt, and you can dislodge them simply by tunnelling beneath them. A falling rock will kill anything it hits – Pookas, Fygars and even you. Why not simply avoid them, you wonder? Easy: a falling rock kill is worth considerably more

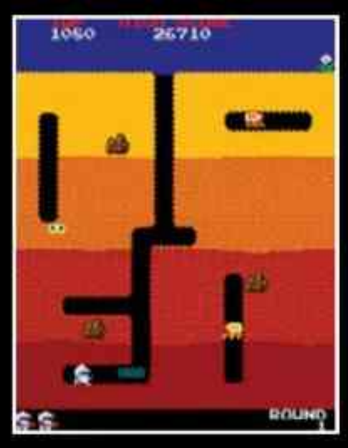
DIGGING DEEPER

Tips for survival and high scores in the dark depths

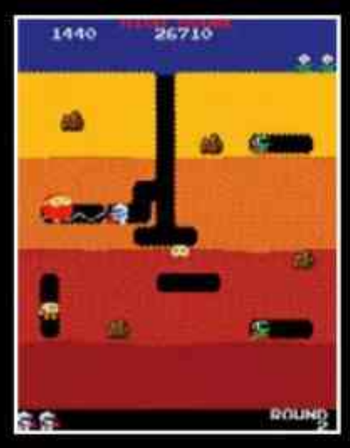


1 Enemies are faster than you, but you can run right through them if they're deflating, so get your pump ready to stun before you run.

2 If you're being pursued by two enemies, pump one. As the second passes it, disengage your pump by turning away to pop them both.

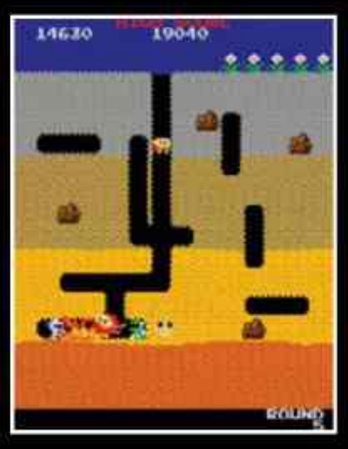


3 The deeper you dig, the more points enemies will be worth when popped. When you can, try to attack enemies in the bottom layer of soil.



4 You can fire your pump through a thin layer of dirt, creating a shield. A Fygar can just breathe fire through it, though, so be careful.

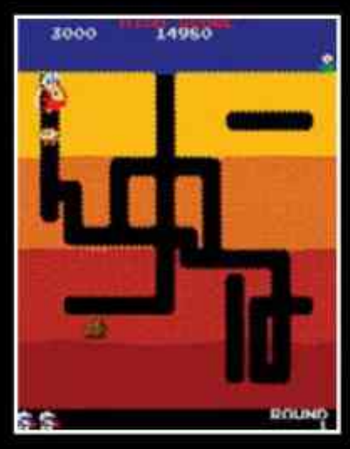
5 The best way to attack a Fygar horizontally is to stun it verticaly, allowing you to safely move to the danger zone and get extra points.



6 Always prioritise a Fygar over a Pooka when you need to destroy an enemy – a Fygar can toast you from afar while you're inflating a Pooka.

7 Flattening enemies by dropping rocks on them will earn you more points than popping them, so be sure to do this if you're after high scores.

8 Bonus items will not appear until two rocks have been dropped, so it's worth dropping them regardless of what's underneath.



9 The last enemy will flee to the top-left corner – only kill the penultimate enemy if you're able to catch the last, so you don't miss out on points.

10 Score high to keep playing! Under most settings, you'll earn an life at 10,000 or 20,000 points, and at various scores thereafter.

points than a standard one, especially in the upper layers, and hitting multiple enemies will award major points. Better yet, dislodging rocks is the only way to trigger the bonus items, which are a variety of foods grown in the ground.

Despite the subterranean theme of the game, *Dig Dug* was far from being an underground hit. The cabinet had appealing artwork, the banjo-style ditty that plays throughout the game sticks in your head easily, and although there were mechanical innovations over Namco's previous maze games *Dig Dug* is, ultimately, a pretty simple game. Namco's testing found that not only was the game accessible, but it appealed to different players in different ways, with some enjoying rock-dropping and others preferring to frantically pump enemies. Not only was the game successful in its native Japan, but also in export markets where Atari sold thousands of cabinets. The game soon found its way to any machine that could run a game.

Later in 1982, Universal's *Mr Do!* would arrive in arcades. Though not officially related to *Dig Dug* in any way, the game greatly expanded on the digging-based gameplay of *Dig Dug* and for many, the two games are closely linked. For fans of *Dig Dug*, its arrival was a blessing – Namco took a long time to capitalise on the success of *Dig Dug* with a follow-up, as the official sequel, *Dig Dug II*, wasn't released until 1985. What's more, the sequel wasn't actually as similar to the original as you might imagine. The game switched to an overhead perspective and allowed the protagonist to defeat enemies (Pookas and Fygars, once more) either by inflating them or sinking the ground they stood on. Unfortunately, it wasn't nearly as popular as the original. As a result, the only contemporary home conversion for *Dig Dug II* was for the NES and it appears on far fewer compilations.

The *Dig Dug* series was trapped below ground until 2001, when Infogrames licensed the game for a low-budget PC revival called *Dig Dug Deeper*. The new game combined aspects of the first two games and received a relatively unenthusiastic response all round. Convinced that there was a good idea buried in that game, Namco once again chose to combine *Dig Dug* and *Dig Dug II* in 2005's *Dig Dug: Digging Strike* for the Nintendo DS. This game focused on boss fights and received a fairly average reception. Namco has also twice remade *Dig Dug* under the title *Dig Dug Arrangement* – once for *Namco Classic Collection Vol. 2* in 1996, and again for *Namco Museum Battle Collection* in 2005. These ▶

» Your last enemy will always try to flee the screen – hunt them down without mercy!

Q&A: DOUG MACRAE

The General Computer Corporation founder shares his memories of converting Dig Dug to the Atari 2600

Had you played *Dig Dug* before you got the job of working on the Atari 2600 version? If so, what did you think of it?
Yes, I had travelled to Japan to see the game so that I could help advise Atari's licensing group. Once Atari had obtained the licence, we received a coin-op version so that we could closely examine the game.

Who was on the team for the Atari 2600 version?
Ava-Robin Cohen did most of the game programming and I did the display kernel. Patty Goodson did the sounds and music. Randall McLamb did the graphics.

What access to the original *Dig Dug* arcade cabinet did you have while working on the conversion?
We had a coin-op cabinet in our lab.

What were the challenges of getting the game on the 2600?
Dig Dug could have many characters on the same horizontal line. The Atari 2600 supported two characters (sprites) on the screen but these could be reset on a scan line basis. We had set up the screen such that we would be resetting the characters, but that we would be multiplexing (flickering) the characters if we had more than two in a horizontal zone. Since the Dig Dug character was the most important, he was allocated more time during multiplexing than the other characters. In the end, the display worked quite well with very little flicker.

How long did you have to work on the game?
We were given four months.

What aspects of the Atari 2600 version of *Dig Dug* were you most pleased with?
The display. We had reduced the flicker such that its impact was pretty minimal.

CONVERSION CAPERS

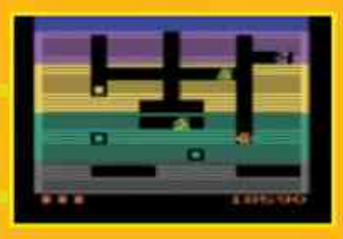
1982 — 1983 — 1984 — 1985 — 1986 — 1987 — 1988 — 1989

ATARI 8-BIT 1982

■ While most Atari versions of *Dig Dug* are good, this first effort is a stinker. It's visually subpar, with wrong-coloured enemies and featureless dirt, and the collision detection is awful. The music's good, though. Atari recognised the poor quality, and converted the Atari 5200 version to replace it in 1983.

ATARI 2600 1983

■ Considering the limitations of the 2600, this is excellent. The graphics are simplified and there's some sprite flicker, but the gameplay is authentic to the arcade version. There's also a new walking tune, too.



ATARI 5200 1983

■ Like most of the Atari versions, *Dig Dug* holds up well on the 5200. It looks closer to the arcade game than many of the early conversions, thanks to good dirt colours and some rather nice detail work.

APPLE II 1983

■ The Apple II version was panned at the time, and we can see why. This conversion is not only ugly, but slow and unresponsive. Everything is in, from the music to the flowers, but it's all quite sub-par.

FAMICOM 1985

■ Being more powerful than most machines on this page, it's no surprise that the Famicom presents one of the best versions of *Dig Dug*. Neither the graphics nor sounds are arcade perfect, but they're about as close as you could expect.

SORD M5 1982

■ *Dig Dug* on the Sord M5 doesn't look very much like the arcade game, but those who seek it out will discover that it does play quite well. The most surprising aspect of the game is that the sound is very good – some of the best amongst the early conversions.

MSX 1984

■ While you'll be dealing with single-coloured sprites all the way here, *Dig Dug* is quite good on the MSX. The game moves along at a nice rate and plays authentically and that tune sounds pretty good indeed. The playfield is even the correct, vertical shape!

FM-7 1984

■ *Dig Dug*'s conversion to Fujitsu's FM-7 was handled by Dempa, and looks very similar to the company's earlier PC-8801 version. The dirt looks nicer but the sprites come off a little worse. Of the two this is preferable for its excellent rendition of the music.

COLECOVISION 1984

■ This Atarisoft conversion of the game exists only as a prototype, as the release was scrapped during the US videogame crash. It plays smoothly, though there's no music at all and the use of flickering to simulate extra colours isn't brilliant.

VIC-20 1983

■ Commodore's machine does a good job of replicating the arcade. It's not the prettiest version, but works well given its limitations. Unfortunately, the controls are less responsive than we'd hoped.

C64 1983

■ Atarisoft's *Dig Dug* is a great effort on the C64, which looks and sounds close to the arcade machine. The enemies are aggressive and you can't fire through thin walls, but this is otherwise a decent version.

TI-99/4A 1983

■ The TI machine gets a perfectly serviceable version of *Dig Dug*, featuring attractive visuals with a rather authentic look and some well-judged gameplay with slightly aggressive enemies.

PC 1983

■ This version is rather ugly, no matter which colour you use and the music consists of awful beeping. There's still a half-decent game of *Dig Dug* beneath all the presentational inadequacies, though.

SHARP X68000 1995

■ Micomsoft's double pack of *Dig Dug* and *Dig Dug II* came very late in the day for the X68000. As you'd expect for such an advanced, powerful machine, this version is basically flawless and really represents the first time *Dig Dug* had received an arcade perfect conversion.

INTELLIVISION 1987

■ Originally developed by Atari in 1984, this version was a victim of the US videogame crash. Thankfully, INTV bought the rights a few years later and tidied it up for a final release.

ATARI 7800 1987

■ *Dig Dug* looks good here, with authentic visuals and gameplay that works as well as ever. Unfortunately, like so many games, the 7800's sound hardware lets it down.

1990 — 1991 — 1992 — 1993 — 1994 — 1995 — AND MORE

AND THE REST...

■ As well as these stand-alone conversions, *Dig Dug* has appeared individually or on Namco Museum compilations for a variety of different formats, with most versions being arcade perfect or practically indistinguishable. Amongst the machines with such conversions are the PlayStation, N64, Dreamcast, PlayStation 2, Xbox, GameCube, Game Boy Advance, PSP, Xbox 360, PlayStation 3 and Wii.

▶ versions have new elements such as simultaneous two-player digging, boss fights, power-ups and more.

As well as direct sequels, *Dig Dug* has a spin-off series. The 1999 action-puzzle game *Mr Driller* entered development as a third entry in the *Dig Dug* series, before changing focus and promoting the new star Susumu Hori. It was, however, the game that finally gave *Dig Dug*'s protagonist his name – Taizo Hori. In Japanese, the name has a double meaning – the surname comes first and forms a pun on the phrase, 'horitai zo', meaning, "I want to dig." Taizo even shows up in a few *Mr Driller* games himself, and Susumu joins Taizo in *Dig Dug: Digging Strike*. As is the case with many of Namco's early games, *Dig Dug* is also frequently referenced in other Namco games, including the likes of *Ridge Racer Type 4* and *Namco X Capcom*, and appears on a variety of Namco Museum compilations. In 2012, Namco's subsidiary ShiftyLook introduced a *Dig Dug* webcomic to celebrate the game's 30th anniversary (but unfortunately, the site is no longer available) and the characters even showed up for cameos in Disney's arcade-themed movie *Wreck-It Ralph*.

There's still a great deal of love for *Dig Dug* out there. Even though *Dig Dug* has fallen into inactivity once again, Namco's constant use of the game in cameos and compilation releases shows the respect that the company has for its heritage. What's more, the way Namco uses *Dig Dug* shows the reason why the game is still regarded fondly by so many players – in an era when games were just starting to harness the power of character design, *Dig Dug* married easily-understood mechanics with attractive visuals to create an appealing game. It wasn't the deepest or most challenging game, but Pookas looked cute enough to draw even non-gamers in and the gameplay was beginner-friendly enough to keep them interested. Over 30 years later, none of that appeal has diminished – and that's why *Dig Dug* is a classic. ✱

GAME BOY 1992

■ With no colour and a scrolling display, it might seem that the Game Boy version of *Dig Dug* is a little lacking. However, Nintendo's handheld offers an trump card in the form of *New Dig Dug*, an arranged version which radically changes the rules to provide a new experience.

THE EVOLUTION OF STREET FIGHTER

FROM HUMBLE ORIGINS TO A WORLD-CONQUERING FIGHTER

If there's one franchise that has changed the shape of gaming as we know it more than any other, it has to be *Street Fighter*. Having a friend or rival watch over your shoulder as you set a new high score and keenly input your initials (most likely in the form of some kind of shorthand profanity) is great and all, but having them eat humble pie from a plate made of your own skill? Priceless.

Street Fighter may not be solely responsible for the concept of competitive gaming, nor was it the first game to introduce the idea. But by allowing us to select a character we could identify with and make work, the *Street Fighter* series without doubt forged many of the tenets by which we currently (and probably always will) go head-to-head with each another under the watchful eye of a digital referee.

And *Street Fighter* has done so much more for us, too. It's given us the perfect way to vent frustration with the real world by wailing on virtual schmucks at the end of a bad day. It's given us a forum in which to chase our ideals of developing gaming skill, while so many other games just want to take us on a nice "experience" holiday or patronise us until we can't see straight. And it has defined, more than any other series, the rules under which modern gaming competition takes place.

It came from nowhere, another also-ran fighter somehow paving the way for a game and a franchise that would alter the gaming landscape forever, something that would shape us as gamers and change our perceptions of what games could and should be. Call it hyperbole if you want, but we defy anyone to name a more influential or important game than *Street Fighter II* – some on a par, perhaps, but none that could claim to have had a quantifiably greater and longer-lasting effect on gaming as we know it.

But it's an odd tale all the same, one where an innocuous fighter is somehow the basis for a sequel that takes the world by storm and spawns a million imitators. Later follow-ups proved *SFII*'s quality to be no fluke; Capcom's success story seemingly wrote itself as the franchise evolved. And while *Street Fighter II* might be the one game that stands out as defining the franchise, each chapter has its own story to tell and its own relevance in the grand scheme of things.

The original's sketchy special move commands; the sequel's unexpected brilliance; *III*'s unwavering determination and peerless quality despite a dying market; *IV*'s ballsy rejuvenation of a genre long thought dead. Hell, all this rags-to-riches story is missing is a John Parr soundtrack and a kickass montage. Join us them as we retread the steps that took Capcom to unexpected greatness and established a franchise to be forever remembered as one of the classics. Not many games make it to 28 and still look so spritely, after all...

THE EVOLUT ER

“While Street Fighter II stands out as defining the franchise, each chapter has its own story to tell”

STREET FIGHTER

HUMBLE BEGINNINGS

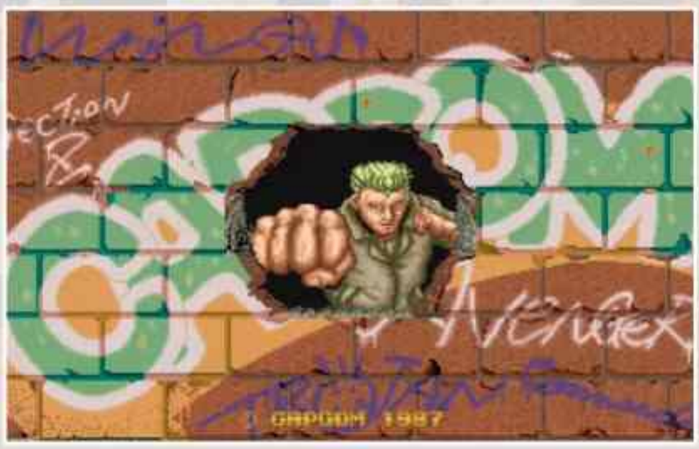
If it's true that the mightiest of oaks can grow from the smallest acorn, it's no great surprise that the unstoppable force that is the *Street Fighter* franchise came from something so microscopic in importance.

Street Fighter was just one of any number of competitive fighting games to emerge in the mid-to-late Eighties, the only things really separating it from the rest of the pack being little more than gimmicks – a deluxe version of the cabinet featured large pressure-sensitive buttons rather than the simpler version's six-button layout, while electing not to inform the player about the existence of Ryu's special moves gave the game an air of mystery and excitement. The deluxe cabinets were later phased out as, predictably, heavy-handed use in the search for the strongest attack led to damage, though the standard six-button system employed by many modern fighting games started life here.

While the game itself was somewhat unremarkable in many respects, it did help launch the careers of some big names in Japanese development. The production and direction team of Takashi Nishiyama and Hiroshi Matsumoto would go on to join SNK and work on rival franchises *Art Of Fighting* and *Fatal Fury*, while Mega Man legend Keiji Inafune got his break at Capcom drawing up character portraits for *Street Fighter*.

» Special move inputs don't always register properly, making on-demand fireballs tricky.

The game proved fairly popular despite its simple premise, later being ported to just about every major home computer system at the time to mixed effect. Tiertex, the studio responsible for handling the ports, even went so far as to release its own unofficial sequel in the form of *Human Killing Machine*, a fighter of questionable content based on the same engine as the version it developed for the ports of Capcom's game. Cheeky, perhaps, but the 8-bit era was hardly a hotbed of morality...



» Joe gets a little extra screen time in the game's intro, punching through a wall to set the scene for the fighting extravaganza. Yo, Joe!

> **"Just one of many games looking to further the one-on-one fighter"**

THE CHALLENGERS

Ryu
Always searching for stronger opponents in order to develop his skills, Ryu embodies purity – while others seek fame and fortune, he seeks only to better himself. The face of the *Street Fighter* franchise and present in every single game to carry the name so far.

Ken
Ryu's sparring partner and friend, Ken Masters started out as an exact copy of the Japanese poster boy (and one that only appeared as player two's character in versus mode) but later developed his own traits. Fear his flaming Dragon Punch, and spamming thereof.

Retsu
A disgraced Kenpo instructor, Retsu is the first hurdle on your quest to winning the tournament. It's not hard to see why the bald guy hasn't appeared in another game since – he goes down easy and doesn't have much in the way of special attacks.

Geki
The generic ninja will see you now. The expected array of shuriken and teleport attacks are all accounted for in this rather bland character, but it takes external influence to flesh him out – according to the comics, he's an assassin from a rival clan to Ibuki's.

Joe
A kickboxer and the first of two American opponents in the original, Joe is nothing special. And while he may not have come back to the *Street Fighter* tournament, he may have been loitering outside – some suggest that he's the blonde dude in the original *Street Fighter II* intro.

Mike
Legal issues forced Capcom to swap some of the character names in *Street Fighter II*, leading Capcom to argue that American boxer Mike and *SFII*'s Balrog (originally Mike Bison) are two separate characters. So that's canon now. Deal with it.

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THE EVOLUTION OF STREET FIGHTER

WHAT IT INTRODUCED

- Pressure-sensitive buttons to unleash various strengths of attack
- The now-standard six-button layout for fighting games
- Some of gaming's most iconic and popular characters

» Considering the artistry of later games, the original's portraits are ugly by comparison.

» Letting a second player interrupt the action was a bold step in the right direction for Capcom.

» With Adon defeated, it's just Sagat to go. Good luck with that – the dude is a total beast.

» Two or three meaty hits from the Muay Thai master is all it takes to end a round in his favour.

WHAT HAPPENED NEXT

Not very much, to be perfectly honest. *Street Fighter* was just one of many games looking to further develop the concept of the one-on-one fighter, though Capcom's take on the idea wasn't really that much more inventive or professional than any of its peers. Indeed, it was a fairly quiet few years for fight fans, following the release of *Street Fighter*, with very little on offer. Home computer gamers would enjoy the likes of Palace's far more satisfying *Barbarian* and EA's somewhat terrible *Budokan* for competitive fighting, but little did we know that Capcom was hard at work on a game that would change gaming history forever.

THE COMPETITION

It was an interesting time for the fighter, the genre still very much in its infancy. The few games *Street Fighter* had in the way of competition all found themselves in the same boat, albeit pushing in different directions, to try and turn an interesting concept into a clearly defined genre. *IK+* enjoyed some success, the three-way fights (and ability to drop your trousers) setting it apart from similar games, while various publishers would try other angles – *Barbarian* toyed with extreme violence, *Ninja Hamster* with cartoon-style silliness and *Galactic Warriors* with mech-based combat. Nobody had a clear advantage over the fledgling genre... well, not yet, at least.

BEFORE STREET FIGHTER

Heavyweight Champ

While not perhaps a spiritual forerunner to modern one-on-one fighters, Sega's arcade machine is acknowledged as being the first competitive fighting videogame. Side-on boxing isn't the best representation of the sport, mind.

Yie Ar Kung Fu

Konami's fighter paved the way for *Street Fighter* and the developer must have been kicking itself – *Yie Ar Kung Fu* is probably the better game, in truth, but Capcom beat Konami to the punch with a stellar sequel.

Way Of The Exploding Fist

A far more accurate portrayal of martial arts than one that includes blazing fireballs and gravity-defying spins, Beam's game worked on a points system rather than employing energy bars, just like real-life competitions.

Lee

Street Fighter's first wall (who you fight on the Great Wall Of China), Lee is about twice as fast as every character previously faced and relentless in his rushdown. Again, he's not come back to the competition, but there are reports that he could be Yun and Yang's uncle.

Gen

The geriatric Chinese assassin seems simple enough here, but later games reveal the intricacies of his fighting style – he's the only character in the *Street Fighter* roster that has two separate stances that completely change his arsenal of attacks.

Birdie

England's burly punk hits hard, and that's enough – it only takes two or three successful hits for him to lay Ryu out. His speed isn't up to much, thankfully, so he's not all that much of a challenge, especially when kept at bay with a barrage of fireballs.

Eagle

Bringing tonfa to a fist fight isn't really on, but the second English fighter (who is also named after a golfing term – read into that what you will) does just that. The extra range serves him well, though the upper-class bouncer has nothing on Dudley's poise.

Adon

This Muay Thai expert turns the screen into a blur of legs that rips through Ryu's health bar, if you're not careful. His attacks favour speed over brute force, as is demonstrated by his Jaguar style to Sagat's more powerful Tiger style.

Sagat

You've faced the expert, now here's the master. Brutal damage and moves for all occasions make him a tough adversary, though Ryu will always come out on top eventually – that's why Sagat has that nasty scar on his chest and bears an eternal grudge towards Japan's finest...

STREET FIGHTER II

THE GAME THAT CHANGED EVERYTHING

Quite how Capcom went from shipping such a run-of-the-mill fighter to creating one of the most important games of all time in the space of one sequel is beyond us. But everything about *Street Fighter II* is just… *right*. The cast of characters, spanning a handful of stereotypes and clichés, are easy to identify with. The controls, now tuned to actually keep up with quick player input and properly register special move commands, are fluid and responsive. And the music… Main composer Yoko Shimomura may not have been particularly fond of fighters but she absolutely nailed it with the amazing selection of character-specific themes. You only have to look at all the cover versions, remixes and repurposed theme tunes that litter the Internet to see just how much impact these pieces of music have had.

"SFII's influence on the genre and on gaming cannot be understated"

Even when it got things wrong, *Street Fighter II* still ended up being right. The ability to cancel normal moves into specials was, believe it or not, a bug rather than a design choice – a bug that has shaped an entire genre and one that without which the fighting game as we know it would be really quite different. The concept was later embraced by Capcom, who developed it into a fully-fledged feature with hit counters and everything, though it's hard to believe that just a staple of the genre came about by accident.

» Scoring fights is an arbitrary hangover from older games, though modern fighters still do it.

» Beating Bison is no mean feat, especially if the arcade owner has bumped up the difficulty.

THE NEW CHALLENGERS

Guile

A US Air Force pilot looking to defeat Bison and avenge his deceased friend and comrade, Charlie. While he has only two special moves, they work so well in tandem that he doesn't need any more. And yes, Guile's theme *does* go with everything.

Blanka

Gaming's most notable wildman, Jimmy Blanka was raised in the jungle after a plane crash (which gave him control over electricity...). The manual describes his fighting style as Capoeira, which is obviously bollocks. He's just crazy.

E. Honda

Throwing yourself headfirst at opponents and slapping them infinite times aren't exactly traditional Sumo techniques, we feel, though Honda has made them his own. A powerful character and a downright terrifying one in the right hands.

Dhalsim

Stretch Armstrong's Indian cousin has unparalleled range, due to his mastery of Yoga. He can breathe fire and later teleport too, which aren't things that have been covered in any Yoga DVDs we've seen. Which isn't many. Any. Whatever.

Chun-Li

An undercover agent out to avenge her father's death at the hands of M. Bison, Chun-Li is notable as one of the first female competitors to feature in a fighting game. Her nimble style and barrages of kicks made her extremely popular.

Zangief

The Red Cyclone is Russia's finest wrestler and let's be honest here – who wouldn't be intimidated by a guy that practiced his moves on bears? His 360-degree input command throw Spinning Piledriver is his signature move, though his lariats are equally useful.

Balrog

No, it's not Mike from the original game. Remember? Capcom said so, so it must be true. He's still called M. Bison in the Japanese games, so people have taken to simply referring to him as 'Boxer' to avoid any confusion. His hobbies include punching.

Regardless, its influence both on the genre and on gaming in general cannot be understated. This was the game that developed the idea of direct competition rather than asynchronous, back-and-forth score attack. This was the game that cemented the idea of having separate characters with unique move sets as a must-have feature. And this is the game that, for many, represented the first steps into the world of gaming, be it a daunting few plays in a dingy arcade or the thrill of having what seemed like a perfect arcade game in your own home. This was the game that changed *everything*.

WHAT HAPPENED NEXT

The insane popularity of the arcade original spawned myriad home conversions and coin-op updates, some less legitimate than others. The SNES port was, for a long time, the most faithful home conversion and remarkably, it's still to this day Capcom's best-selling game. The first official arcade variant came in the form of *Champion Edition*, letting players use the four boss characters and addressing several issues, while *Hyper Fighting* was Capcom's way of going toe-to-toe with all the board hacks doing the rounds. *Super* later added new four characters, with *SSFII Turbo* finally unleashing Super Combos on the world.

THE COMPETITION

The cutthroat arcade scene wasted little time in jumping on *Street Fighter II*'s spectacular success and for several years, the market was awash with fighters looking to pull the rug out from under Capcom's accidental classic. SNK came to the fore during this time, with *Fatal Fury, Art Of Fighting, Samurai Shodown* and *King Of Fighters* all emerging in the space of a few years with slightly different takes on the one-on-one brawler. Midway's *Mortal Kombat* was another key competitor, digitised graphics and controversial levels of gore helping it to mainstream success. Even home platform exclusives started trying to best official ports of the Capcom game; the likes of Team 17's *Body Blows, Eternal Champions* and *Clayfighter* were among those that wanted a slice of this booming genre.

WHAT IT INTRODUCED

- Selectable characters for unprecedented depth and replayability
- The fighting genre's first example of a combo system, albeit by mistake
- The very notion of competitive gaming as an alternative to taking turns and comparing scores

OTHER STREET FIGHTERS

Street Fighter Alpha: Warrior's Dreams

Developed as a prequel series to *Street Fighter II*, the *Alpha* games fleshed out the characters and introduced new ones to develop the franchise's universe. Technical elements like the super meter arrived, as did new features like the Alpha Counter.

Street Fighter Alpha 2

A continuation of the original *Alpha*'s ideas, *Alpha 2* introduced Custom Combos – a system that let players burn super gauge in order to unleash unique strings of moves and specials that might not otherwise combo. Oh, and a handful of new characters too.

Street Fighter Alpha 3

The pinnacle of the sub-series and still one of the greatest fighters ever made. Selectable fighting styles and a wealth of characters offered even greater freedom and depth – hardly surprising, seeing as how this came out after *Street Fighter III*.

Vega

Another name swap victim, the clawed cage fighter's Japanese name of Balrog actually makes far more sense. His arrogance and grace in battle make him a love/hate character, though most that have faced a skilled Vega player will probably lean towards hate.

M. Bison

The Shadaloo boss and final opponent in *SFII* (Vega in the Japanese version, to tie up the name-swap silliness), Bison's Psycho Power gives him incredible combat potential. If you've not screamed his name in frustration, you didn't grow up in the Nineties.

Cammy

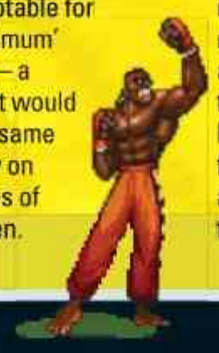
Both British secret service agent and former Shadaloo puppet, Cammy's past is somewhat messy but that's not to say it hasn't made her an exceptional fighter. Simple to use, quick and relatively powerful, she's probably one of the best all-round fighters in the series.

T. Hawk

One of *SF*'s worst cases of racial stereotyping, Native American combatant T. Hawk (or Thunder Hawk to his friends) actually fills a gap in the roster pretty well – a large, heavy-hitting character that doesn't have to rely on grapples. Not that that makes it okay.

Dee Jay

The only character in the series designed by Capcom US and among the most hated. Coincidence? Another iffy racial stereotype, mainly notable for his 'Maximum' trousers – a word that would read the same vertically on both sides of the screen.



Fei Long

Yeah, okay, so the new challengers were all pretty much dodgy stereotypes. Still, Fei Long's kung fu skills offered a far closer representation of a real martial art than anything presented by the series so far, hence him becoming a fairly popular addition to the roster.

Akuma

The embodiment of evil and the antithesis of Ryu. He's the younger brother of Ryu and Ken's sensei and has gone totally off the rails in his search for ultimate power. A recurring secret boss in the franchise – be on the lookout for his Raging Demon. You might want to jump.

DESPERATE TIMES...

With the world and its dog having developed a bunch of 2D fighters and saturated the market to the point where not even the hardcore could really bring themselves to care, the late Nineties wasn't a good time to be a beat-'em-up fan. Capcom had been plugging away with the *Street Fighter* brand through the popular *Alpha* spin-off franchise but when it came to develop a full sequel, apathy had set in within the fighting community to a dangerous degree. And with 3D fighters starting to really come into their own as well, it seemed like Capcom was fighting a losing battle.

But determined to buck the trend and take back its crown from the genre's new 3D pretenders, Capcom came good with a gorgeous and inventive return to form. A brand new cast (with the exception of returning fighters Ryu and Ken) gave willing players an entire new roster of archetypes to learn and the Parry system – while not exactly embraced at the time of release – would go on to create a moment that will go down in gaming history forever. At the Evo 2003 tournament, the high-level feature seemed like something beyond the grasp of many, but when Daigo parried all 15 hits of Justin Wong's Chun-Li Super Art and responded with a perfect combo to win, the room erupted and the entire world stopped to take notice of fighters once more. There could literally have been no better advert for *3rd Strike*.

» Some players could never bring themselves to fly the nest, sticking with good ol' Ryu and Ken.

> **"SFIII was determined to take back its crown from the new 3D pretenders"**

» Backgrounds and music stack up beautifully with the gorgeous sprites and animation.

WHAT IT INTRODUCED

- The Parry system, a risk/reward mechanic for advanced players
- Selectable Super Arts, offering several ways to play each character
- True juggle combos, allowing quick players to land extra hits on airborne opponents

WHAT HAPPENED NEXT

With the 3D boom and the almost entirely new cast causing *III* to be far less of a success story than its predecessor, Capcom pulled its old trick with a pair of updates to the arcade version. *2nd Impact* brought several new characters, the ability to escape throws and the first example of EX special moves, while *3rd Strike* arrived a good two years later, bringing with it yet more new fighters, a refined input system for advanced abilities and balance tweaks that would make it perhaps the greatest 2D fighter ever made. Stellar Dreamcast ports of the first two games (as the *Double Impact* collection) and *3rd Strike* brought the action home, plus it would later appear alongside *Hyper Street Fighter II* on the *Anniversary Collection*, released for PlayStation 2 and Xbox to mark 15 years of the franchise.

THE COMPETITION

Capcom's rivals had really started to establish themselves by this point, although the real threat didn't come from Midway or from SNK – it came from polygons. With PlayStation taking then-revolutionary

THE NEW CHALLENGERS

Makoto

The young Japanese Karate expert isn't for everyone, though her rushdown style makes her *Street Fighter III*'s glass cannon – land your big combo and you've probably won but sit back and defend and it's as good as over.

Q

Street Fighter's mystery man, little is known about what Q actually is. Favouring brute force over speed and lengthy combos, he's a fierce opponent in the right hands, not least because his taunt ups his defence by a *lot*.

Remy

France's answer to Guile is far more delicate and elegant than his military analog, though he's not much less dangerous. His extra special moves also make him a somewhat more interesting character to learn.

Twelve

The gooey experiment that is Twelve is probably the worst character in *SFIII*, though many have learned him for just that reason – nobody expects his bizarre fighting style, and with powers of flight and invisibility, he can be tricky to catch.

Alex

Another brawler, albeit one with a few more tricks up his sleeve than usual. Originally intended as a replacement for *SFII* frontmen Ryu and Ken, his play-style didn't help him fit this role, nor did the fact that they both came back.

Dudley

A gentleman boxer is the perfect counterpoint to Balrog's bullish approach to fisticuffs – Dudley's butler is always on hand and the pugilist can even throw roses with his taunt, a makeshift projectile perfect for carving an opening.

Elena

If you thought Chun-Li was all legs, you ain't seen nothing yet. Elena's stunning animation remains one of the highlights of *SFIII*, those stupidly long legs flailing around the screen constantly and many of her specials linking together into one fluid combo.

Ibuki

The original has generic ninja Geki but *SFIII* gets the far more interesting Ibuki, another fragile character that excels in rushdown play and in confusing the opponent into making mistakes. Her taunt reverses the opponent's controls briefly, if successful.

KEN

» In truth, Sean's move pool isn't dreadful – it's his lack of priority really hurts him.

» Yun is by far the better of the Lee twins, although Yang's style still won him plenty of fans.

strides in 3D home gaming and arcade boards growing more powerful at a shocking rate, 3D fighting games like *Virtua Fighter*, *Tekken* and *Soul Blade* proved far more interesting and novel to gamers than the sprite-based visuals they had been fighting with for a decade. Despite dwindling interest in traditional 2D fighters, the push for quality resulted in some of history's finest fighters – *3rd Strike* is without doubt Capcom's best while SNK's answer, *Garou: Mark Of The Wolves*, is right up there as well. What, no love for *Mortal Kombat*? No. Move along.

OTHER STREET FIGHTERS

Street Fighter EX

With the 3D revolution in full swing, Capcom didn't want to be too late to the party it helped start. It did, however, turn up horrifically dressed and half-cut – *Street Fighter*, it seemed, was not cut out for life in 3D.

Street Fighter EX2

But that didn't stop a sequel from surfacing, improving matters slightly but still not to an extent where the game has any worth above 2D versions of the game. A side mode did pave the way for *SFIV*'s character-specific Trials, though.

Street Fighter EX3

A PlayStation 2 launch title, but not one of the better ones. The same dodgy 3D visuals returned, joined this time by a tag mechanic similar to the *Versus* series and *Tekken Tag Tournament*. Not one of the series' high points.

» Letting Q taunt isn't the best idea – even with Urien setting up Aegis Reflectors everywhere, the robotic freak is still a monster after a taunt or two...

> **"The real threat didn't come from Midway or SNK, it came from polygons"**

Necro

SFIII's version of Blanka, if you will, replete with an electrocution attack and a screen-spanning spin, albeit horizontally rather than vertically. He's not much of a threat, but you can't help but feel for a character who has to apologise every time he's late.

Oro

Two arms? Sod that, Oro can beat you with just one. Among the franchise's oddest fighters, this old guy's unconventional style won him few fans at launch, but the fact that he's mained by one of the UK's best players, Zak Bennett, shows there's something there...

Sean

If you wake up in a fighting game one day and your Super Art is a one-hit fireball, it shouldn't take too long to work out that you're a joke character. Sean is *SFIII*'s Dan, then – no amount of training under that filthy scrub Ken is going to do anyone any good, after all.

Yun

Genei Jin *is* Yun. His third Super Art lets him stylishly link almost any of his specials into one destructive combo with the right execution, making him a perfect choice for high level players. Doing one damage, his hat spin taunt is perfect for trolling.

Yang

The runt of the litter, Yang started life as a palette swap of Yun but later got given his own moves and abilities. Which, sadly, made him worse. He's a decent fighter, though his custom combo Super Art is nothing compared to Genei Jin.

Gill

The game's every-bit-as-cheap-as-expected boss, Gill can either use his super gauge to rain fire down on the screen for insane damage (even if blocked) or conserve it to resurrect when defeated. And if that's not cheap, we don't know what is.

Urien

A rushdown charge character is a rare beast indeed, and Urien fills the role brilliantly. He could probably do with wearing more than just a pair of pants when going into a fight, though his crazy combo potential makes up for his inability to dress himself.

Hugo

He's number one, apparently. *SFIII*'s Zangief equivalent as no less than three command grabs (and two more in his Super Arts), but he has more ways to close distance than the Russian ever did. Don't expect that to make him easy to play, though...

PLAY STREET FIGHTER IV

A LEGEND IS REBORN

The eight years between *Street Fighter EX3* and *IV* represented the longest the series had ever gone without a new game, largely because many senior Capcom figures weren't exactly behind the project. But relatively unknown Capcom producer Yoshinori Ono pushed relentlessly for a new *Street Fighter* game despite opposition from his peers and superiors.

After the roaring success of the HD remake of *Super Street Fighter II*, though, the Capcom suits were left little choice but to sit up and pay attention to Ono, who was put in charge of bringing back *Street Fighter* properly. The thinking behind the belated comeback was simple – set between *SFII* and *SFIII*, *Street Fighter IV* would bring back the entire cast of world warriors from the series' most popular game while mirroring its accessibility.

SFIV was designed to be instantly familiar and that proved to be one of the core strengths of this late return. But as well as ensuring a low entry barrier and a balanced playing field, Capcom also did a great job of making *IV* a multi-tiered affair that could be employed by players of all skill levels. Take the Focus Attack, for example. Newcomers could use it to stun hesitant opponents for a free combo, intermediate players could use its armour properties to absorb single blows in a similar way to *SFIII*'s Parry (using a dash to cancel recovery or activation of the actual attack) while pros could use it to cancel attacks, leading to some of the game's flashiest combos. The comeback mechanic, Ultra Combos, offered similar depth – many newcomers could throw out hopeful Ultras, but most characters could combo into their ultimate attacks with the right set-up. *Street Fighter* was back on top.

WHAT HAPPENED NEXT

With the current hardware generation poised to overflow with me-too shooters, Capcom's timing in bringing back *Street Fighter* was absolutely perfect. Long-dormant fighting fans rose from their slumber to seek out arcade units, with the improved home version bringing competitive fighting back to the masses just like *SFII* had done 17 years before. The *Super* version added new characters and selectable Ultra Combos, and *Arcade Edition* bringing a further four to bring it in line with the latest coin-op version.

» Some characters, such as Gen, can combo from Super Combos into Ultra Combos.

THE NEW CHALLENGERS

Abel

French amnesiac Abel remembers nothing of his past... except for massively complicated close-combat moves. It's likely that he was a discarded prototype in the program that led to the creation of *SFIV*'s boss, Seth.

C. Viper

Many claim she looks more like an SNK character than a Capcom one but Viper fits into the *SFIV* cast just fine. Her combat suit lets her burn and electrocute, with jump jets in her heels making her one of two with a Super Jump.

Cody

Final Fight veteran Cody makes his return here, after debuting in the *Alpha* sub-series. He's still rocking the convict look and chucks stones around like a child, plus he's apparently even left a knife on the floor in every place he might go.

Dan

The series' leading joke character makes his main series debut, having been formally introduced as a parody of the way SNK were thought to be ripping off Capcom's fighters. And the strangest part about him? He's not actually rubbish.

El Fuerte

It might have a couple of wrestlers already but Fuerte's spindly form, crazy speed and Lucha Libre skills set him apart from the stocky grapplers. He's an annoyance as much as a usable character, mostly because he never shuts up.

Evil Ryu

What would happen if Ryu's search for power took him down a darker path? He'd get a few new moves and be better at fighting, apparently. Makes perfect sense. Another *Alpha* callback, Evil Ryu entered the fray in *Arcade Edition*.

Gouken

'You must defeat Sheng Long to stand a chance', reads Ryu's original *SFII* victory quote. Well, now's your chance. Gouken *is* Sheng Long, Ryu and Ken's former master making his first playable appearance here. Not just an April Fool's joke, then...

Guy

Another *Final Fight* star, leaving Haggar as the only absentee. Still, he's busy fighting Galactus in *Marvel Vs Capcom 3*. Guy's American ninja awesome-looking combos won him many fans – we like him for his 'Profound... sadness...' win quote.

THE FUTURE

Thanks to the success of *Street Fighter IV*, the franchise is once again big news and it will come as no surprise to learn that *Street Fighter V* was announced in 2014. What is surprising however is the amount of effort Capcom is putting into the game, and it appears to have been taken on all the feedback from *Street Fighter IV*.

By far the biggest news about *Street Fighter V* is that Capcom is revamping many of the classic characters, so they look and play differently. It's a bold move, but one we're confident will be pulled off. It's also bringing back plenty of old stalwarts, including Birdie, Nash and R. Mika, but has introduced plenty of new characters soon. Needless to say, we can't wait until the game hits in 2016.

WHAT IT INTRODUCED

- The Focus Attack: a chargeable crumple that absorbs blows and can be used to cancel attacks
- Full online integration, turning the whole world into your very own arcade
- Trials mode, an inventive way of practically teaching combos and skills

OTHER STREET FIGHTERS

Marvel Super Heroes Vs Street Fighter

Pitting Marvel's finest nonsense warriors against a host of Capcom's martial artists may not have seemed fair. But by turning everything up to 11, Capcom managed to make it a frenetic and exciting crossover.

Capcom Vs SNK 2: Mark Of The Millennium 2001

Not strictly a *Street Fighter* game perhaps but Capcom's representatives in *CVS2* came predominantly from its leading fighting brand. Of all of the older crossover fighters, this is easily the one that still holds up best.

Street Fighter X Tekken

While hardly retro (on account of having come out this year, *SFXT* gave a mammoth cast of *Street Fighter* stars the chance to beat down 3D fighting's finest. And they did – though the *SF* guys and gals work way better in a 2D game.

» Dan used to be a joke character but in *SSFIV*, he's not entirely awful. Good, almost. Wow.

"Capcom's timing in bringing back Street Fighter was perfect"

Hakan

What *is* Hakan…? He's red, has blue egg cartons on his head and fights by smearing himself in oil then throwing people around.

Juri

The hot-headed Korean S.I.N. agent was reportedly added in at the request of Capcom Korea, but her origin doesn't alter that she's an awesome character both to watch and play. She's also *Street Fighter*'s only Taekwondo practitioner to date.

Rose

The *Alpha* games gave us some great characters, with many of the best returning in *IV* and its variants. She was decent in vanilla *IV* but really came into her own in *Super*, with her second Ultra Combo, Soul Satellite.

Rufus

The fat guy hates Ken, so we really identify with him. Like *Tekken*'s Bob, his size belies his speed and with dive kicks and screen-spanning assaults aplenty, he's a force to be reckoned with. His moves flow so beautifully, he's a joy to play.

Sakura

Ryu's protégé and another *Alpha* alumnus, Sakura returns in *IV* to offer players her own Hurricane Kicks, Dragon Punches and fireballs. Not the strongest, but tweaks to her abilities in *Super* made her more viable.

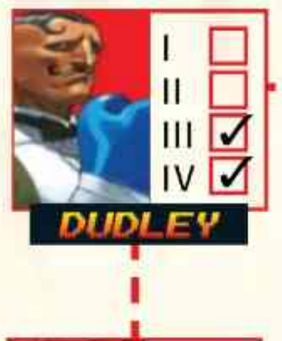
Seth

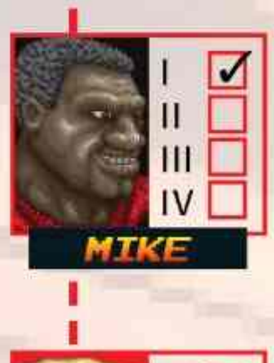
Named after former Capcom community manager and fighting game champ Seth Killian, this blue monster is *IV*'s final boss. And like Gill before him, he's supremely cheap. Not so much when you play *as* him rather than against him, mind...

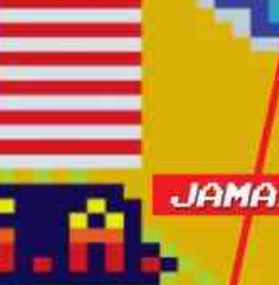
Oni

Evil Akuma probably wouldn't have made much sense, so Capcom instead settled on Oni. That's what he is, though – a blazing, even-more-powerful version of the famous hidden boss. He even has a version of the Raging Demon that can be performed in the air.

THE WORLD WARRIORS







U.S.A

FRANCE

ENGLAND

GERMANY

U.S.A

MEXICO

MEXICO

U.S.A

JAMAICA

JAMAICA

SPAIN

BRAZIL

BRAZIL

SPAIN

ITALY

KENYA

UNKNOWN

BIRDIE

EAGLE

ZANGIEF

RUSSIA

NECRO

ONI

GOUKEN

SAKURA

MAKOTO

IBUKI

ORO

E.HONDA

AKUMA

RETSU

GEKI

RYU

EVIL RYU

U.S.S.R.

JAPAN

JAPAN

JAPAN

CLAND

INDIA

INDIA

THAILAND

HONG KONG

CHINA

HONGKONG

CHINA

SOUTH KOREA

TURKEY

JURI

HAKAN

DHALISM

THAILAND

ADON

FEI LONG

SAGAT

YANG

DAN

YUN

GEN

CHUN-LI

LEE

IN THE KNOW

» **Publisher:** Atari Inc

» **Developer:** Atari Inc

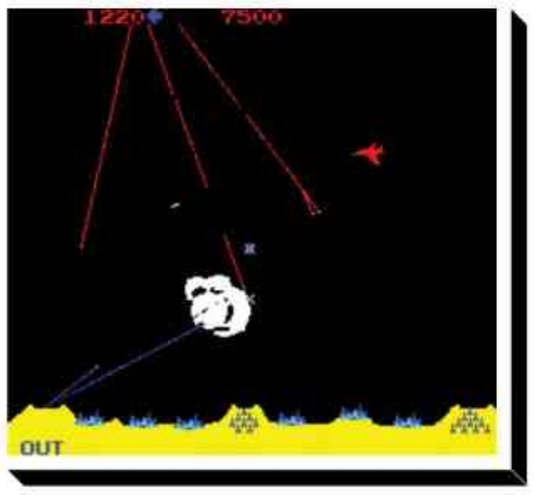
» **Released:** 1980

» **Systems:** Arcade, Various

» **Genre:** Shoot-'em-up

Missile Command

Retro Gamer takes a definitive look back at a classic arcade game and unravels its brilliance through those who know it best



That you're even reading this magazine means that there's a good chance you've played, or at the very least heard of, *Missile Command*. One of Atari's most popular titles from the golden age of arcade games, it saw players assume the role of a poor chap working the busiest day of his life inside a missile defence facility.

The brainchild of Atari's Dave Theurer, *Missile Command* tasks you with protecting six cities from airborne missile salvos (you can read an exclusive interview about the game's creation with Dave and Rich Adam on page 62). In the game you have access to three mounted missile launchers, which each hold ten rounds of ammunition. Activated by three fire buttons – one on the left and right of the screen, with a third in the middle – you must use them tactically and skilfully to shoot down the approaching thermonuclear missiles as precisely as possible, and play continues until the six cities you are defending are destroyed. The game starts off deceptively easy, but as missiles begin splitting into multiple targets and low-flying planes and satellites enter the picture, the gameplay soon becomes very, very hectic. It's also worth noting that *Missile Command* cannot be finished or won in any traditional sense – it is simply an endurance test between man and machine. 'The End' is therefore inevitable. Deep, man. Very deep.

Missile Command's core concept came about as a result of the Cold War between the Soviet Union and the United States. Initially there were plans to make the game as realistic as possible, as the cities you had to defend were all based on real-life locations along the Californian coastline. The cities of San Francisco, Los Angeles, Santa Barbara, San Diego, Eureka and San Luis Obispo were all originally due to appear as the cities for each stage, but the idea to set the game on the real-life Californian coast was eventually dropped due to the potential controversy that it might create. Instead, the player ended up defending six unnamed, unrecognisable locations.

Despite its nameless setting, the game was based on the very real threat of all-out nuclear war, which was considered a distinct possibility at the time of *Missile Command*'s development period. This took its toll on the development team, though, with Dave in particular being affected by the game's theme and gruelling development schedule and suffering nightmares as a result.

Nuclear nightmares aside, there was no denying that *Missile Command* was an incredibly good game that instantly became a huge success when it was released in arcades. It became a huge money-spinner for Atari, and it has been firmly ingrained in popular culture, with the hulking cabinet appearing in everything from *Chuck* and *Fast Times At Ridgemont High* to, appropriately, *Terminator 2: Judgment Day*.

We'd argue that *Missile Command*'s success was down to a combination of its topical setting, the popularisation of the shoot-'em-up genre that was brought about by the release of Taito's *Space Invaders*, and for also being an incredibly tight game that requires real skill to play – we've never been able to get anywhere near Tony Temple's impressive world record, no matter how many times we've tried. Undoubtedly another key aspect of *Missile Command*'s popularity was its clever implementation of a trackball. With any other control method at the helm the game just isn't the same – play it on MAME with a joypad or keyboard if you don't believe us – and this is because the ball is perfectly attuned to the game's frenetic and reaction-based gameplay, giving players an unrivalled sense of speed and precision that many other games of the time simply couldn't manage.

You need only look at the few home ports and countless unofficial clones to know that a joypad simply isn't as effective in helping you pull off the superhuman feats of dexterity that are needed to survive on the later stages and reach the highest scores. Despite the stiff challenge it poses, though, *Missile Command*'s sheer simplicity means that anybody can play it, even if few of them will ever be able to truly master it.

It remains a sensational piece of work that once again proves that the simplest of game concepts are nearly always the best.

the expert

PROFILE

» **Name:** Tony Temple
» **Age:** 42
» **Location:** Wiltshire
» **Key Twin Galaxies World Records:**
Missile Command [Arcade] 4,472,570
Super Missile Command [Arcade] 164,630

Tony Temple has secured records with both Twin Galaxies and Guinness on Atari's classic arcade machine, having broken a 20-year-old record to get it. Here's how he did it...

■ When did you first encounter *Missile Command*?
Well, *Missile Command* just happened to be the main game that was sited at my local videogame emporium, Rita's Café in Bristol. This would have been in around 1981 or so. It was pure chance more than anything; the fact is that it could have been any arcade game from the golden era, I suppose. It was sat alongside a *Gorgar* pinball machine and a *Moon Cresta* upright cabinet. Rita's was a grotty old place, so with hindsight, it was a miracle they had such a prestigious game – and original too. I recall they had a lot of bootleg games over the years. I would go there, and sit with a warm, 20p milky cup of piss-weak tea, and play *Missile Command* for hours.

■ Why did it appeal to you?
I was drawn to it primarily because of the controls – they were pretty unique and complex for the time. I really liked the idea of having total precise control of the game in all directions. It wasn't just a case of moving left, right, up and down and one fire button – you could move the crosshair in all directions, as slow or fast as you liked, and then have to decide which of three fire buttons to use. Whereas other players were turned off by the complexity and relentlessness of the game, I just saw it as a huge challenge. And, of course, the subject matter resonated with everyone at that time – nuclear war was seen as a real possibility, and *Missile Command* I think played on many of those fears we had as kids. At 13 years old, we were all quite impressionable, I suppose, and imagining that you were saving the world probably helped my gameplay

and made my desire to conquer the game greater than the older people who played it, perhaps.

■ When did you realise that you had a good shot at the record?
In 2005 when I got my cab, I discovered Twin Galaxies and saw that there were two types of *Missile Command* score recognised by Guinness. One was the marathon settings world record score, which was, and still is, 81 million points – to beat this would require you to play the game for over two days straight. That wasn't very appealing, to be honest – that's a test of endurance, not skill. But the other score type, known as tournament settings, looked more of a challenge. If you're familiar with *Missile Command*, you'll know that you normally get a bonus city every 10,000 points. Well, in tournament mode, you get no bonuses at all. Once the six cities are gone, that's it. The high score here was 1.69 million points, held by a guy called Roy Shildt. He'd held the score since 1984 and no one had come close since. I thought it was beatable, so changed the settings on my cab to tournament settings, and starting playing. In March 2006, I scored 1.9 million points and got into the 2007 *Guinness Book Of Records* as a result. I've since increased my world record score. In August 2010 I managed 4,472,570 points and became the first person to get past the 'kill screen' on *Missile Command* in tournament mode.

■ How long does it take to set your high score?
The scoring rate on *Missile Command* tournament settings is about a million points every 40 minutes or so. My current 4.4 million point world record score took just under three hours.

■ What sort of practice would you put in to get your score?
Well, being at the age I am and with a young family, a mortgage to pay and job responsibilities, not as much as I'd like. But I've been able to focus in on the game intently when I've needed to. I play very little now but do put in intensive play before playing live in the US, which a bunch of us do each year. When I went for a new world record in 2010, I played every other night for around two months. It's not a huge sacrifice, to be honest, and I wouldn't really regard it as practice – after all, every time you play, it could be 'the one' where the world record drops! The best way to learn *Missile Command* is to get in there and play it.

■ How did it feel to beat a record that had stood for over 20 years?

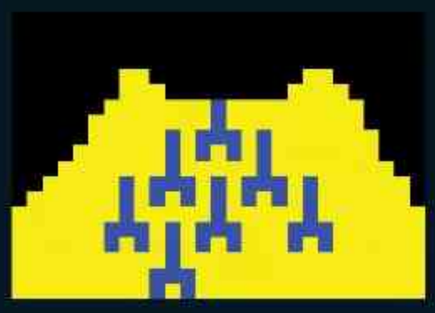
War Games

Things to look out for if under nuclear attack from a rogue nation

Cursor
This cursor is used to set the launch trajectory of your missiles, which explode where it's placed.

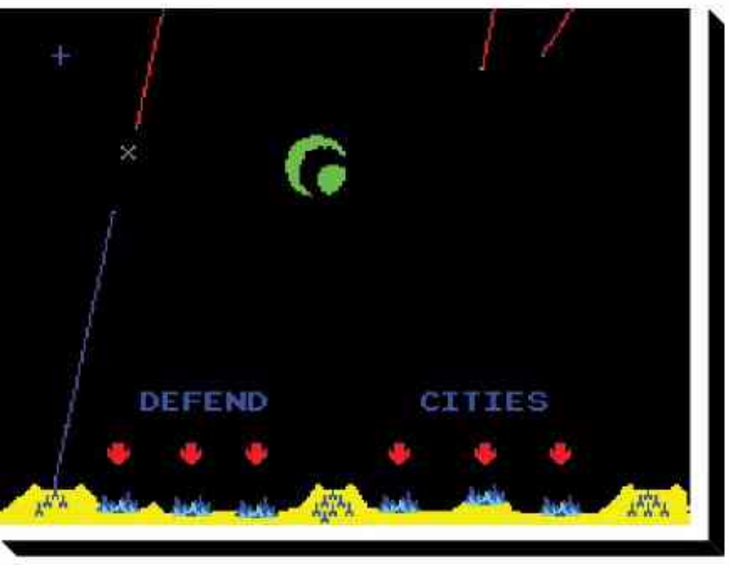
Cities
The object is to ensure the protection of the six identical-looking cities in the game.

Silos
There are three defence silos at your command: Alpha, Beta and Omega. Activation of each is denoted by the three fire buttons.



Missiles and Smart Bombs
There are two types of threat: standard missiles and smart bombs, which can sneakily change path.

Satellites and Bombers
Occasionally satellites and bombers appear in the middle of the screen and drop more missiles. They can be destroyed first.



» In the event of a nuclear war, we want Tony to be manning the missile shields.

It felt good, of course. It was nice to be recognised for the achievement. I wasn't splashed all over *Time* magazine or anything, but it's nice to be listed in the Guinness book. The most pleasing thing was simply beating a score that many people saw as impossible, and to start flying the flag for us here in the UK. No one had come near to the world record in over 20 years, so it was seen as big news in classic arcade gaming circles. I think it did a lot to resurrect interest in the game – I know of a few guys in the USA who went out and bought a cab as a result of seeing my score.

■ Did Roy Shildt congratulate you for beating his record?

Actually he did. As the previous record holder for over 20 years, he was surprisingly gracious – much to his credit. I don't think he was particularly happy about it – who would be? – but he acknowledged my ability, before going off on one about trackball settings, Twin Galaxies, his comic book, *The King Of Kong*, Arnold Schwarzenegger and Billy Mitchell's hot sauce. Roy tends to get a little worked up about quite mundane things. He has what I think we could call 'passion'. Or maybe he's just 5150; I'm not sure which.

■ Is it true that there's a fierce rivalry between you?

Well, I suppose there is, yes. People have built up this *King Of Kong* scenario around us – but the reality is slightly less gripping. Roy shouts loudly about *Missile Command* and Tony Temple every now and then to whoever will listen to him, and I just sort of shrug my shoulders and get on with life. Roy is a colourful character and can be pretty difficult to deal with. He'll tell you that he's the true champion, and that he could beat my score any time he likes. I've never met the guy but I suspect I will play him soon, head to head, which will be quite something. Many people want to see that happen, and I'm warming to the idea now. ✱

TONY'S SURVIVAL GUIDE

Top tips to help you reach the finish line in record time

1 ■ DON'T PANIC

The fundamental rule with this game is not to panic. There is a lot going on, and players tend to lose control, firing shots off all over the place. This will not help your game at all. There is no need to fire three missiles up to take out just a single one coming down! And if you are playing in marathon mode, remember you get a bonus city every 10,000 points.

2 ■ THE RIGHT BASE

Try to use the appropriate missile base. If a missile is coming down the right-hand side of your screen, try to use your right-hand base to take it out.

3 ■ SAVE THE MIDDLE MISSILES

You'll notice that the missiles from the centre base do travel at a slightly faster speed than those from the side bases. Try to use your two side bases' missiles first, and save your middle ones – they come in handy when shooting down the smart bombs on the later waves. Work on your 'spreads' – a line of missile clouds you can create about halfway up the screen at the start of the later waves. This tactic buys you a bit of thinking time.

4 ■ THE TRACKBALL

Get used to the speed of the trackball. Every one is different – some are really responsive and others you have to fight hard with. Once you've got the feel of it, you can start to play more instinctively. This is key to getting high scores. Things should start to become second nature, and you'll find yourself shooting things down without thinking about it.

5 ■ PLANES AND SATELLITES

As a general rule, try to shoot planes and satellites down as soon as they appear. Removing the danger early is a good idea anyway, plus the quicker you remove them, the quicker you'll get an opportunity to shoot more, generating more points.

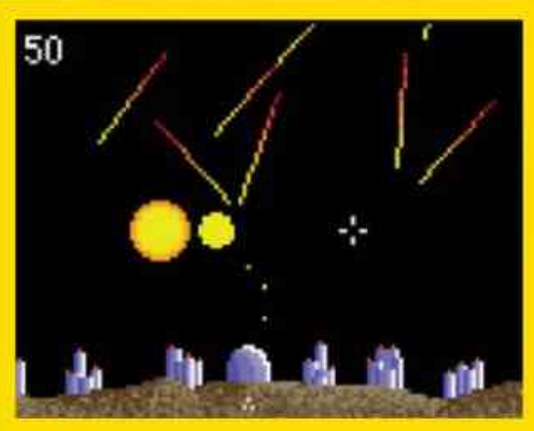
the sequels

Despite the lack of a true Missile Command 2, there are several spin-offs

Liberator

Released: 1982

Aside from *Missile Command VR* – a virtual reality offering that appeared in 1994 – there were no arcade sequels to *Missile Command*, which is very strange considering how popular it was. *Liberator*, then, is like a spiritual sequel to *Missile Command* that was based on the popular *Atari Force* comic series. The game is essentially an inverted take on the *Missile Command* concept in that players must destroy bases rather than defend them. Targets are situated on a rotating planet, and players launch their attack via four immovable spaceships that are positioned in each corner of the screen. Moving a targeting crosshair with a trackball, players must destroy all the targets before their ships are destroyed.



Super Missile Command

Released: 1994

The Lynx has many underrated gems and this is one of them. This excellent update to *Missile Command* offers all the thrills and spills of the original arcade game, but also a few neat twists too. In addition to introducing new enemies and updating the graphics rather nicely, by far the best upgrade to the game was a new power-up system whereby players were awarded money at the end of each stage, which could then be put towards specific power-ups that either boosted your missile capabilities or your defences. It's a solid follow-up that also featured a similarly decent update of *Asteroids* on the same cartridge.

Missile Command VR and 3D

Released: 1995

Missile Command 2 never got beyond the prototype stage as Atari presumably struggled with how best to extend the original concept. It would be 14 years before fans got an arcade follow-up, and this came by the unusual way of *Missile Command VR*, which ambitiously took the core gameplay and, as its title implies, blasted it into the computer-generated world of virtual reality. Split into three stages, this sequel saw players trying to defend bases from hostile alien invaders. Virtuality, the game's developer, released the game for the Atari Jaguar as *Missile Command 3D*, where it's the only title compatible with the console's VR headset.

the machine

As well as being the world champion at Missile Command, Tony is the owner of one of the most immaculate examples of the cabinet. And some of you might have even played it in the flesh...

"The machine was obtained from Archer Maclean in 2005. We were talking about what he did for a hobby – restoring and collecting old arcade machines – and this old game I was pretty good at back in the Eighties called *Missile Command*. Archer took me down into his arcade dungeon and there it was. I hadn't seen a machine in the flesh for over 20 years – I was like a kid in a candy shop. The cab was a mess – it was covered in concrete splashes, insect nests, dust and general debris. The trackball was rusted solid, there were no locks and the side art was torn and scratched. Archer won't thank me for saying this, but he spent an incredible amount of time restoring the thing for me – on and off for over a year! It was stripped, cleaned and photographed. New parts were sourced from the US, and the side art was completely rescanned, reprinted and reapplied. The attention to detail is frightening."

BUTTONS

Obviously a key element to the game! These are sealed switches that aren't made any more. The start buttons are illuminated in red; the fire buttons are standard. You can also find these buttons on the old Atari *Sprint* and *Asteroids* cabinets. Getting hold of replacements is really difficult, and as they are sealed units, they cannot be fixed. When they go, they go!

MONITOR

Standard 19-inch Wells Gardner monitor. Archer put a NOS one in during the restoration process. These raster monitors are becoming very difficult to source now. The bezel is actually smoked glass – again an idea Archer had, just to add his own signature to the restoration and the machine. This was custom made and cut at a glass factory, and had the lettering screen printed on. The bezels on standard machines are Perspex. Again, it just makes the cab a little different, but keeps it true to the original machine.

TRACKBALL

The trackball is quite a complex bit of kit and is what makes the game so challenging. The trackball itself is actually a standard candlepin bowling ball, would you believe! I have a brand new one that I must get round to fitting. It sits on two rollers on the X and Y planes. The faster you roll the ball, the faster these spin. Optical sensors track the speeds of the two rollers in relation to each other and the gubbins inside the game translate these movements to the position of your crosshair. They are pretty easy to maintain – two drops of sewing machine oil every couple of months in the bearings keeps things nice and smooth.

MARQUEE

Dave Theurer, the guy who wrote the game, is notoriously quiet and reclusive about his time at Atari. Luckily, I managed to get a lead, and via a friend, he agreed to sign some bits and pieces for me. I sent my marquee off in the post to him, and Dave very kindly signed it, as you can see. As far as I know, this is the only signed *Missile Command* marquee in the world, which makes my machine particularly unique.

COIN SLOTS

We've kept these to take original quarters – I think they could be adapted to take UK coins. I have 20 quarters dated from 1980 – I know that's pretty nerdy, but they were a gift from Walter Day – and the coin mechanisms do work fine, but I tend to keep the machine on freeplay for ease of use. If you look closely, you'll see that Archer did a particularly personal modification for me on the coin slots themselves…

RESTORATION

Archer believes that my cab is probably of better quality than those that rolled off the production line. It wasn't cheap, but then I felt I was investing in something special. He is particularly proud of the job he did – and rightly so. I've had it for six years, and despite being moved around a fair bit and two boys in the house, it's held up well. The community estimate that there are fewer than ten *Missile Command* uprights in the country right now, so it really is a piece of history. Your readers may have played it at one of the many retro shows it's been to.

developer Q&A

We speak to Rob Fulop, the man behind two of the Atari 2600's best conversions: Space Invaders and, of course, Missile Command

How were you involved with the 2600 port?
We had a brainstorming session to come up with possible new 2600 games. On the list were two very popular Atari coin-ops, *Missile Command* and *Asteroids*, both of which were deemed impractical to pull off on the limited 2600 hardware. Over lunch, Brad Stewart started discussing various approaches to each game, and that lunch turned into a whiteboard-filled scribble-fest, after which we pitched the 2600 programming team our ideas about how both games could be done. We each were given 30 days to come up with a live 'kernel', which would display the main game elements on the screen.

Did you work with Dave Theurer on the project?
I had gotten to know Dave from the year before. Prior to my work on *Missile Command*, I had delivered a version of *Space Invaders* for the Atari 800 where I had decided to not copy the original, and my ears were ringing from the criticism that I received both from the market and my peers as a result. People just wanted the game they knew from the arcade, end of story. So when I sat down to make *Missile Command*, I decided that I would make as faithful a rendition as I possibly could. As the 2600 version was coming together, I would drop in and chat with Dave about the finer points of *Missile Command*. I remember looking at the original attack tables and the smart bomb algorithm. And, of course, the scoring system was a straight-out copy.

Did you ever receive feedback from him about the finished game? How did he feel about it?
The coin-op group was very doubtful that any sort of good game could be made on the Atari 2600. They had built all of their games on custom hardware with whatever amount of memory they needed to get the job done. I remember them being quite impressed when they played the finished game, not as much with my work, but with what was possible with the 2600 hardware. I think *Missile Command* and *Asteroids* changed people's perception of the 2600 as a development platform.

How long a deadline did you have and did any other staff work on it with you?
There was no official deadline, but it was assumed that a single game should take from 5-9 months. I think *Missile Command* was done in seven months.

What was the hardest thing about the Atari 2600 project, from a technical viewpoint?
Getting the right feel of the onslaught and figuring out how to balance the game with only one available base instead of the three in the original coin-op. It is very easy to make a game like *Missile Command* overly difficult, and it is also pretty easy to make the game very easy to beat. The trick is to find the balance between the two and craft a 'difficulty ramp' that kept getting a little harder each time. *Missile Command* taught me all about the importance of creating a dedicated system that allows the programmer to easily tweak a lot of variables. There was actually a development version of the game where I could change values on screen while the game was running. This was invaluable in finding the right combination of speeds and timing variables so that each level could deliver the challenge that was needed.

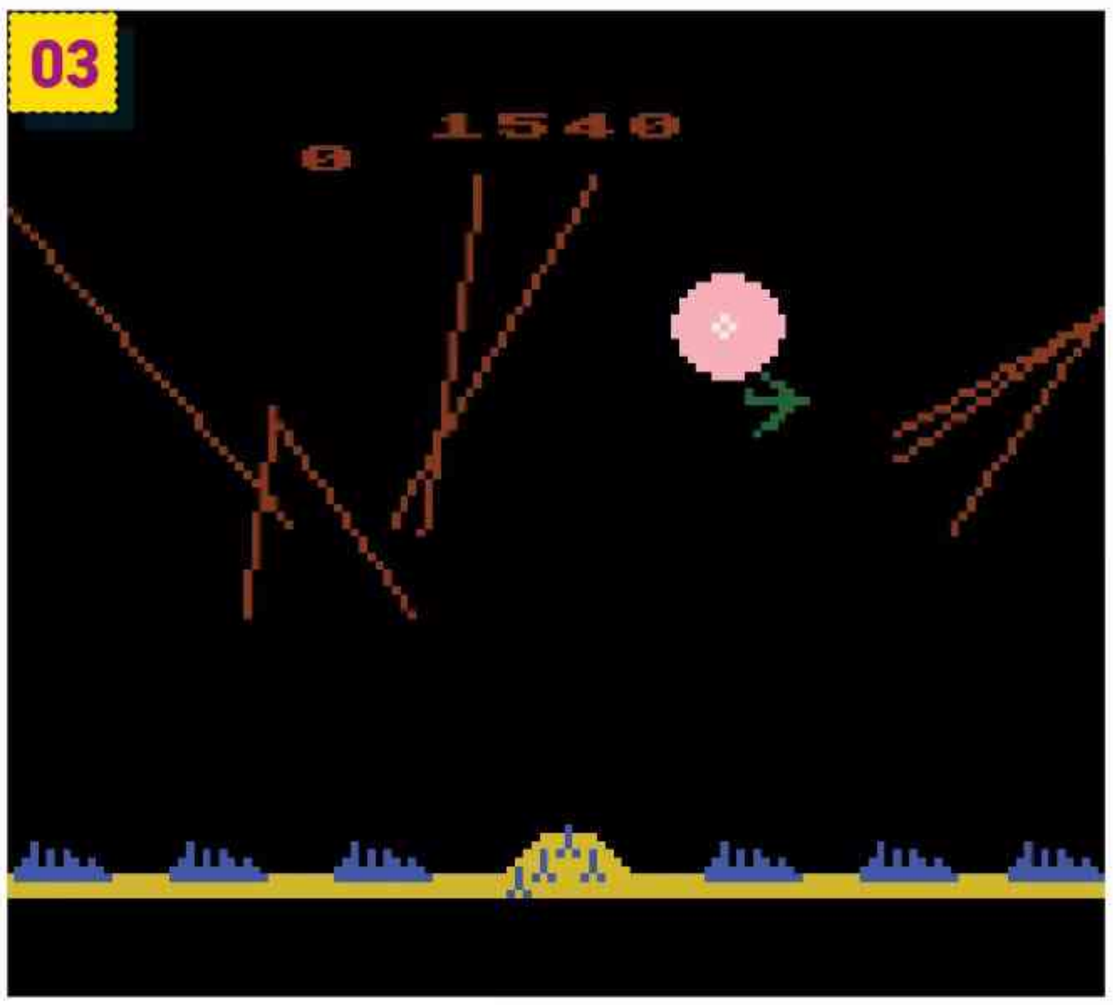
Were you happy with the final result?
Yeah, I remember adding the final explosion at the end, after the player loses, and playing it through and really feeling good about it.

Can you tell us any interesting anecdotes about your time working on the game?
One Friday, I had gone out to a long Mexican lunch with a bunch of fellow programmers, which included a few rounds of margaritas. This was a typical Friday activity, although it was unusual for me to drink, since I wasn't a big fan of drinking during the day. But for whatever reason this day I had consumed half a pitcher or so of strong margaritas. So now I basically stumble back to work at 2:15 in the afternoon, flat-out drunk. I sat down at my workstation and had the presence of mind to decide that, given my condition, it would be a good time to make a backup of my current version, which hadn't been backed up in a few weeks – all of our work was kept on eight-inch floppy disks at the time. So I dug out the *Missile Command* backup disc and put it in the spare drive next to my original development disk, which I worked off every day. Then I promptly copied my two-week-old backup version over my current version, effectively throwing away my past two weeks of work in one single drunken keystroke. I was so disgusted! Needless to say, I came in at 7:30am the next morning and worked all day Saturday and Sunday to restore the game to its pre-margarita state. Along the way I swatted a few nasty bugs that had crept into the code somehow, and overall improved a lot of the game's performance. This is typical of what happens whenever I've blown away something in a game and had to revert to an older version. Rewriting the code always improves it.

Finally, have you played any other conversions of the game? How do you think yours holds up?
I really haven't played many other versions of *Missile Command* other than my own, and the original obviously. ✱

the conversions

Appearing at a time when clones were commonplace in the market, there is an absolutely ridiculous number of official and unofficial ports of Missile Command. Join us, then, as we compare all the ports to carry the Atari seal of approval



01. Atari 8-Bit [Best Version]

The version that Atari put out for its 400/800 line of computers was a great effort that featured a few nice improvements over the 2600 port. This included vapour trails being left behind the enemy rockets, and the inclusion of the bombers and satellite enemies. Sadly, like all of Atari's 8-bit *Missile Command* ports, this version was missing a full complement of missile silos, limiting the depth of its gameplay. Regardless, this is still an impressive-looking conversion. Incidentally, this version also appeared as a built-in game for Atari's ill-fated XEGS console.

02. Atari 2600

Even though the Atari 2600 version is missing two silo bases, it still plays a faithful game of *Missile Command*, and what it takes with one hand – there are no bombers or satellites – it gives back with the other by allowing players to influence the behaviour of the missiles and speed of the target cursor. This port was also the first to do away with the Cold War setting, replacing it with a less contentious alien invasion scenario, as detailed in the game's manual.

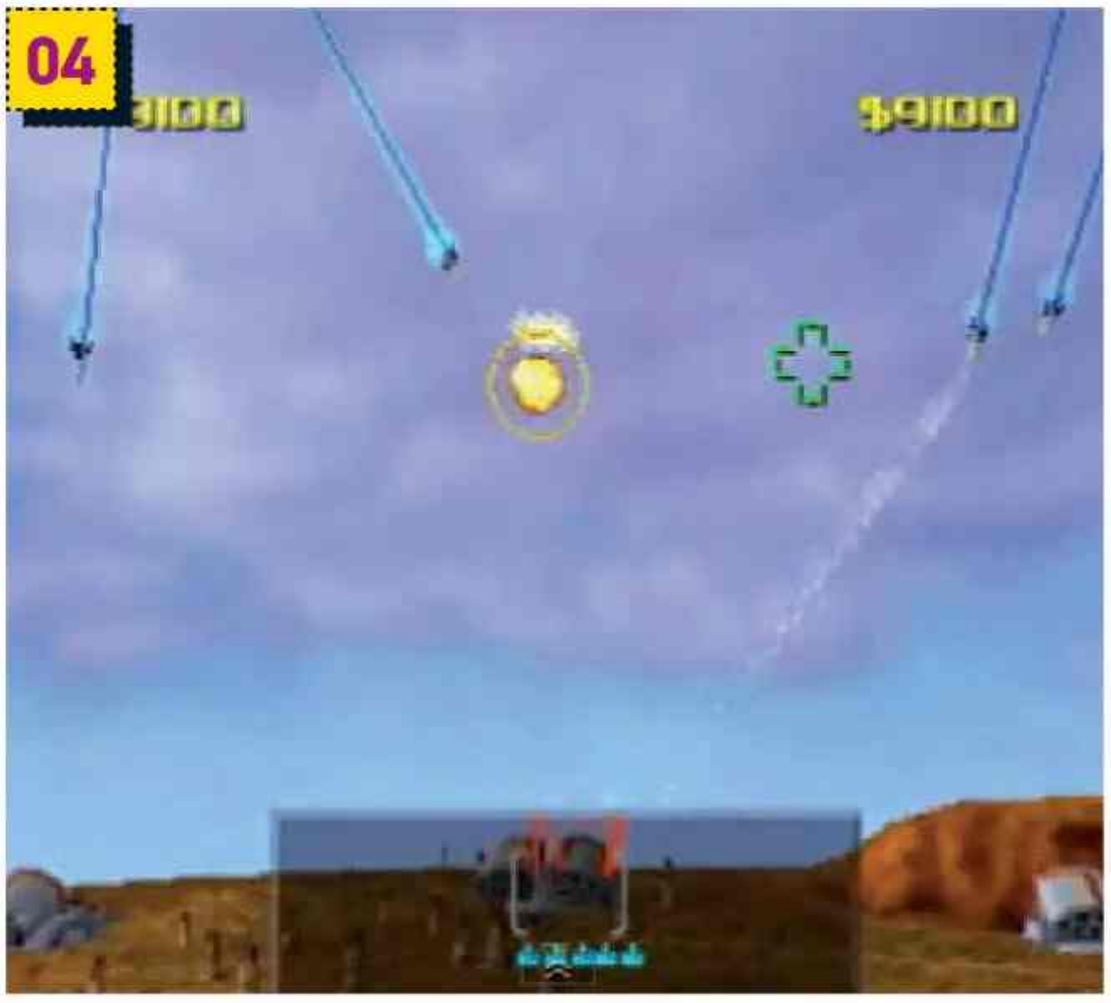
03. Atari 5200

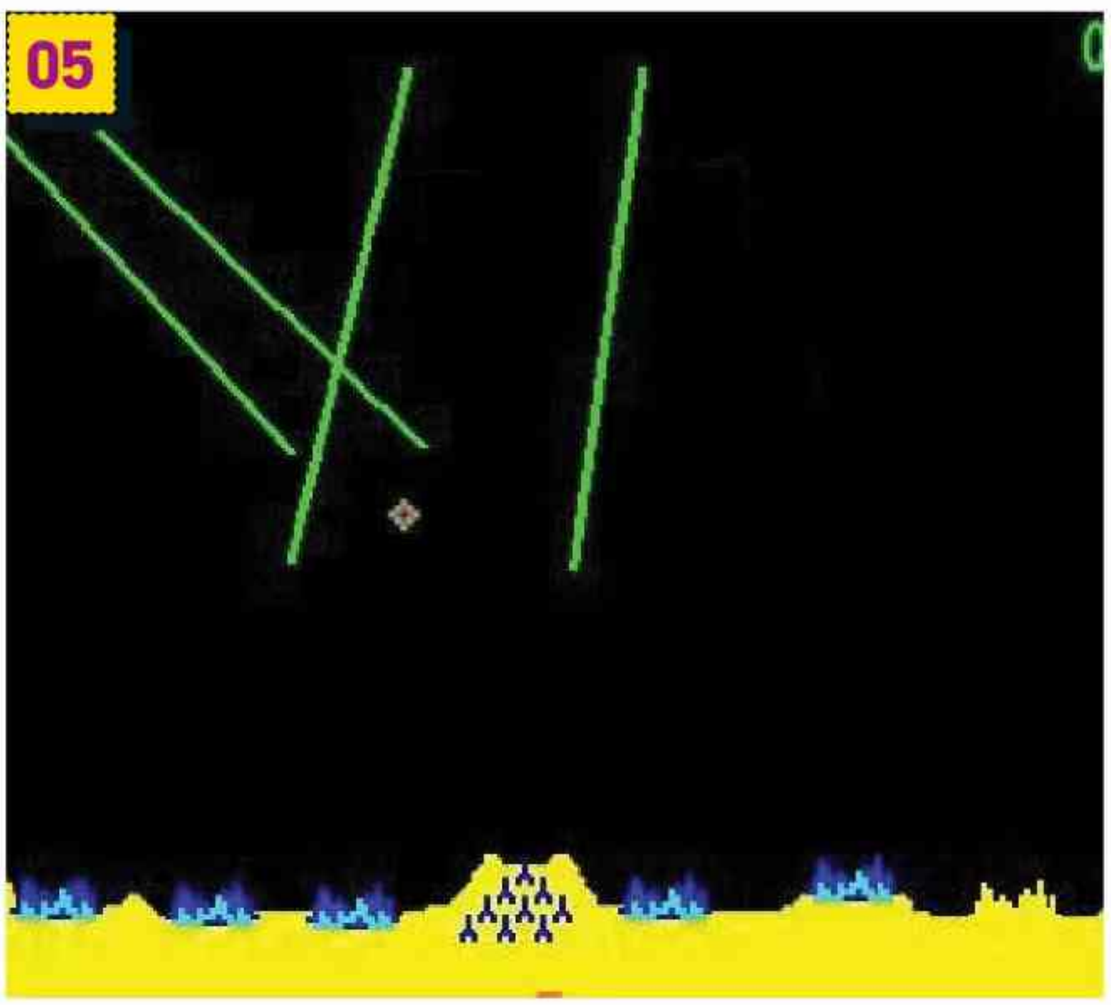
The 5200 also received a decent conversion of *Missile Command* that featured a number of improvements over the 2600 port, although that is probably to be expected. As well as a crisper and more colourful nuclear war, this version also included the bombers and satellite enemies from the arcade game. Sadly, players still only had a single base with which to defend their six cities. As such, this version feels more like an enhancement of the Atari 2600 port rather than a more faithful arcade conversion.

04. PC and PlayStation

This game was an official remake from Hasbro. It featured both a classic and 'ultimate' mode that swapped out the silos for spaceships and also added alien enemies, CG cut-scenes, bosses, and allowed players to spend points earned on purchasing shields and upgrading their missiles. The PC version is the one to play as it supports mouse controls. Essentially a baby trackball controller that's been

SPECIAL THANKS TO **TONY TEMPLE** FOR HIS HELP AND ASSISTANCE THROUGHOUT THIS ARTICLE





turned on its head and given buttons for feet, it's a control system that, as you would expect, works quite well for dragging cursors around the screen.

05. iPhone

Atari also released, but then oddly pulled, a decent iOS version of *Missile Command* for Apple's devices. Due to the immediate nature of touch-screen controls and its automatic silo selection, the game takes a while to get challenging, but it's still a good port. The game featured two modes, classic and ultra, with the latter throwing in new enemies and cleaning up the visuals. Atari recently plugged the gap left by its mysterious disappearance with an update called *Missile Command Ultra*. This version features redrawn graphics, allows you to dual-wield silos and includes a two-player head-to-head mode. Sadly no classic mode, though.

06. Xbox 360

As we're clearly happy to fill this page with late adaptations that push the very definition of the word 'conversion', we had to include the Xbox 360 port of *Missile Command*, which is official, is simply called *Missile Command*, and also features an obligatory graphically enhanced remake – one that supplants the missile silos with electricity pylons that direct energy into the sky. Sacrilege. The Live Arcade version does feature a classic mode that attempts to replicate the one-button-to-one-silo control system with the face buttons on the Xbox controller – it's just a crying shame movement with the analogue stick isn't all that fantastic.

07. Game Boy Color [Worst Version]

After purchasing Atari properties, Hasbro released a portable conversion of *Missile Command* for the Game Boy Color. Sadly, it was a terrible version. Here, you command two missile silos, actuated by the A and B buttons, while the target cursor is steered using the D-pad. Sadly, though, the visuals, animation and gameplay are where the game falls down. The explosions flicker, hang in the sky for ages and are too tiny. It makes the action feel far too imprecise – a big no-no for *Missile Command*.

SPACE INVADERS

In a rare interview with Japan's godfather of videogames, **Jonti Davies** speaks with Tomohiro Nishikado about the birth of the game that triggered a revolution 37 years ago

» Ex-Taito visionary, Tomohiro Nishikado.

For a man who single-handedly turned his country into a nation of videogame junkies, and without whom Shigeru Miyamoto claims he would not even have joined the game industry, Tomohiro Nishikado is a surprisingly unassuming and down-to-earth kind of chap. Since 1996 he's been running his own operation, a 22-strong development studio called Dreams, just down the road from Sega in Tokyo. It's a quiet and unnoticed developer that seems to be deliberately avoiding the limelight – the discography on Dreams' website is nothing more than a list of generic terms: 'Action game for PS2', 'Communication game for DS', and so on. So it's quite odd to think that 37 years ago, when in his tenth year at Taito, Nishikado alone produced a global phenomenon in the mesmerising and boldly innovative *Space Invaders*.

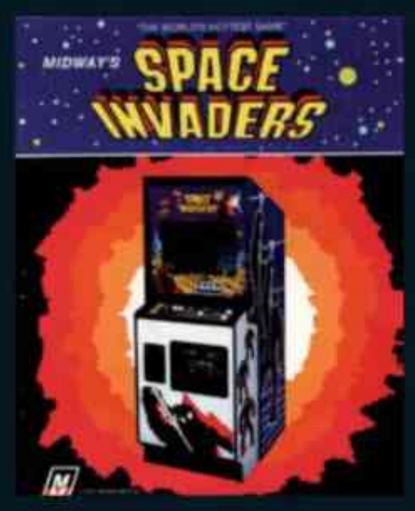
Let's head back to 1978. "At the time," says Nishikado, "the block destruction [*Block Kuzushi*] game *Breakout* was really popular in Japan, and I was hooked on it myself. I'd made a few games up until that point, but when I experienced *Breakout* it made me want to drive myself to develop a game that would surpass it." But where many developers would have been more than content to code a superior clone of *Breakout* with a few clever enhancements (which is precisely what another Taito designer, Akira Fujita, would do a decade later), Nishikado took a completely different stance as he sought to surpass the addictive 'bat, ball and block-breaking' system of Atari's 1976 classic. Thanks to his keen perceptive powers, Nishikado was able to see beneath the surface of *Breakout* and identify the mechanism that was causing him and so many other young Japanese to put their 100-yen coins in the slots of Atari's cabinets.

"For me," Nishikado elaborates, "the really interesting element of *Breakout* was the art of deciding on a number of targets and that sense of achievement you'd get from destroying a whole group of blocks simultaneously to clear the stage. I analysed the exhilaration players felt when playing *Breakout* like this, and I eventually decided to capitalise on this [gameplay design] by trying my hand at a shooting game where *Breakout*'s quadrilateral targets would be replaced with targets that had more interesting forms."

Had Taito's top man not told Nishikado to make changes to the design of his project, *Space Invaders* would have ended up with people taking the roles of those "interesting forms" Nishikado was looking for. "During the development process, I had the enemy targets set as humans," he reveals, "but Taito's then-president told me to stop using humans in such a way. I initially thought, 'Okay, if I substitute the humans with monster-like creatures, that should work out fine'. But then I saw a newspaper article saying that *Star Wars* had been extremely well received in America, so I decided on using space aliens instead of monsters. *Star Wars* had just hit the theatres in America and was about to be premiered in Japan, so there was a bit of a 'space boom' happening. And that's why I opted to make my game's targets aliens from outer space."

With that settled, Nishikado continued with his work as an independent entity within Taito, which is how he liked to operate in those days (even today, he seems to value autonomy: his Dreams outfit works with/for 20 or so Japanese soft cos, maintaining complete independence). Apart from

IN THE KNOW



» **PUBLISHERS:** TAITO

» **DEVELOPER:** TOMOHIRO NISHIKADO

» **RELEASED:** 1978

» **SYSTEMS:** ARCADE, VARIOUS

» **GENRE:** SHOOT-'EM-UP

“Star Wars had just hit the theatres in America and was about to be premiered in Japan, so there was a bit of a ‘space boom’ happening … That’s why I decided to make my game’s targets aliens from outer space” NISHIKADO REVEALS THAT GEORGE LUCAS’S WORK HAD AN EFFECT ON SPACE INVADERS, AS DID H.G. WELLS AND MARINE LIFE...

the cabinet design and some sound work, *Space Invaders* was exclusively Nishikado’s baby: “I let a new employee work on the sound source and produce *Space Invaders*’ audio effects, but apart from that, all of the other work – namely the planning, the design, graphics design, coding the software, building the hardware – I did entirely by myself.” He managed to turn the game around in remarkably quick time, especially given how his first job was the daunting task of producing his own development tools specifically for this project: “From the initial conception of the idea right through to the completion of the game,” Nishikado confirms, “*Space Invaders* took me approximately 12 months to produce.” That was the year that was.

Having joined Taito with a degree in Engineering from the electrical engineering-focused Tokyo Denki University, Nishikado was apparently seen within the company as something of a go-to man for any hardware-related tasks. His first three games for Taito – 1970’s *Skyfighter* and its sequel the following year, and 1972’s *Borderline* – were all mechanically operated creations; games without screens. Nishikado’s great skill was to improvise with existing materials and create something that was entertaining and challenging. With *Space Invaders,* however, he realised that his new project was too ambitious for the technology and software he had to hand – new tools would be required, and who better to produce them than the engineer-programmer himself?

“There really was no microcomputer hardware in Japan during the late 1970s,” Nishikado laments, “so I used American hardware [including the Intel 8080 CPU] as a reference point and then took it upon myself to remodel it. Also, there was no game development environment to speak of, so I began to create my own development tools from scratch. I drew up a rough specification document and started programming while consulting that paper, but I was thinking about the efficiency of the tools I was making more than anything else, which complicated things. Because of that, I would create and program an original development tool and then realise that I’d soon need another tool as well, so I’d build that from scratch next… in the end, this process took up about half of *Space Invaders*’ entire development period.”

Those six months of preparatory work were, of course, quite worthwhile. The limitations of 1978 vintage hardware and memory capacities caused Nishikado no end of headaches, though. As he worked towards realising his *Star Wars*-inspired dreams of a game to tap into the space boom, he was also faced with the realisation that capacity and power were at a strict premium. Still, Nishikado accepted that he had to work with what was available, reconfiguring and reworking until he had the tools and hardware required to get the *Space Invaders* he could see in his mind’s eye onto a monitor. Ever the innovator, he quickly moved on from the most primitive of methodologies to something altogether more forward thinking: “At first,” Nishikado says, “I drew a plan for the screen layout on paper and then put that up on the screen, but if I wasn’t happy with it because it didn’t look good, I would have to start drawing a new frame action and put that up as a replacement, and so on. That was the process I was using – I really wasn’t able to

» *Space Invaders* spawned many copycats, but far from irritating Nishikado, he takes an ‘imitation is the greatest form of flattery’ approach.

» The ‘Nagoya shot’ technique in action: finding invulnerability as the Invaders encroach was just one of the tricks discovered by Japan’s fanatical players of the game in 1978.

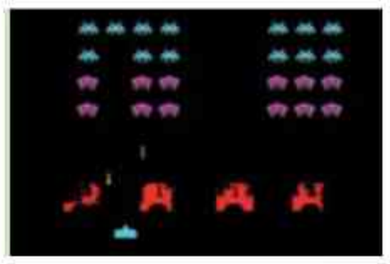
draw any good results that way, though. So in view of that, I created something that these days we take for granted: paint tools, whereby I could use a light pen to easily make corrections to the graphics. This enabled me to complete the graphics with ease and in relative comfort. I think that, at the time, this was a groundbreaking development tool."

Thanks to his inventive time-saving measures, Nishikado was able to work with greater efficiency once the groundwork had been done and his development environment had been established. And as his processes became smoother and less jarring, it became much easier for him to express influences other than *Star Wars*. In particular, the enemy forms in *Space Invaders* began to take on new subtleties and idiosyncrasies. Nishikado explains: "I took the octopus-like aliens from H.G. Wells's *War of the Worlds* as a starting point, to influence the design of the biggest enemy targets in the game. For the targets in the middle of the screen, I modelled them on the image of a crab, and for the uppermost enemies I was thinking of squids. I was imagining the enemies as marine life. The aliens' movement was basic because of the low memory capacity I had to work with, which meant I could only program two patterns [of movement]. But I felt that in some ways, simple was best."

It's probably just as well that Nishikado was content (to a point) with simple design, because the specs of the *Space Invaders* hardware would allow nothing greater. Getting the hardware properly and advantageously configured was in itself a great and time-consuming challenge: "For the base CPU board, I remodelled an existing game board," Nishikado recalls. "I replaced the ROM section with RAM and then developed Monitor ROM. This enabled 16 blocks of data to be input using the keyboard, which meant it was possible to use the keyboard to execute programs. I made various functions and features in the Monitor ROM, including an option that would let me save any programs I made to cassette tape. Of course, I also included a function so that I could produce graphics while looking at the monitor. I used the one kilobyte of static RAM available at the time to compose 64 units of eight kilobytes each lined up for

» The population of Japan took the title screen's encouragement to 'Insert Coins' to excess, children and adults alike.

Space Invaders Twelve



SPACE INVADERS PART II (Arcade, 1979)

Tomohiro Nishikado's first direct sequel to *Space Invaders* was, he admits, not as big a hit as the original. Still, it had some interesting features, including increased complexity to the movement of its enemy targets.

RETURN OF THE INVADERS (Arcade, 1985)

Although Nishikado was no longer at the helm, Taito went ahead with a jazzed-up *Invaders* sequel in 1985. *Return of the Invaders* again increased the variety of Invaders' movement patterns, as well as brightening things up.

MAJESTIC TWELVE: THE SPACE INVADERS PART IV (Arcade, 1990)

Known as *Super Space Invaders '91* outside of Japan, this introduced scrolling backgrounds, shields and power-ups. It also featured a series of stages in which you needed to protect cattle from UFOs…

SPACE INVADERS DX (Arcade, 1993)

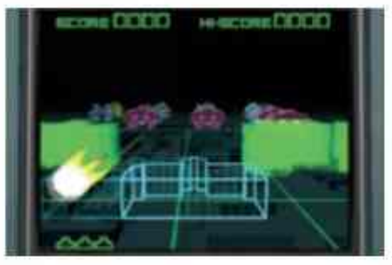
Featuring a traditional Space Invader Mode, a two-player split-screen Battle Mode and a Parody Mode, *Space Invaders DX* was an experimental game whose best features would be better developed in *Space Invaders '95/Akkanbeder.*

AKKANBEDER / SPACE INVADERS '95 (Arcade, 1995)

This great *Space Invaders* parody took a pun to arrive at its title: 'akkanbe' is what kids say as they pull one eyelid down and stick their tongue out to make a funny face at another kid, a teacher or a parent.

SPACE RAIDERS / SPACE INVADERS: INVASION DAY (PS2, 2002)

This Sammy-developed *Space Invaders* spin-off brought the series into *Earth Defense Force* territory, arming a few heroes with big guns and telling them to kill Invaders who have already landed on Earth.



SPACE INVADERS ANNIVERSARY (PS2, 2003)

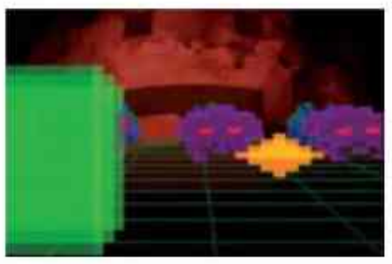
Notable for including an original 3D Mode, *Space Invaders Anniversary* was an unremarkable collection of variations of *Space Invaders* and *Part II*. The PSP attempt would prove much more worthwhile…

SPACE INVADERS POCKET (PSP, 2005)

This neat compilation contains four variations of the original *Space Invaders* (namely black and white, colour, cellophane colour effect and upright cab styles) as well as *Part II, Return, Majestic Twelve* and *Akkanbeder.*

SPACE INVADERS REVOLUTION (DS, 2005)

Nishikado himself developed *Revolution*, using the opportunity to incorporate touch-screen controls (digital controls remain far superior), 13 Invader types and a variety of new power-ups and settings.



3D SPACE INVADERS (Mobile, 2006)

Providing the option to turn *Space Invaders* into a first-person shooter of sorts, the Taito-developed *3D Space Invaders* is surprisingly ambitious given that it is a game you can play on your mobile phone. Defending on the go!

SPACE INVADERS EXTREME (DS/PSP/XBLA, 2007)

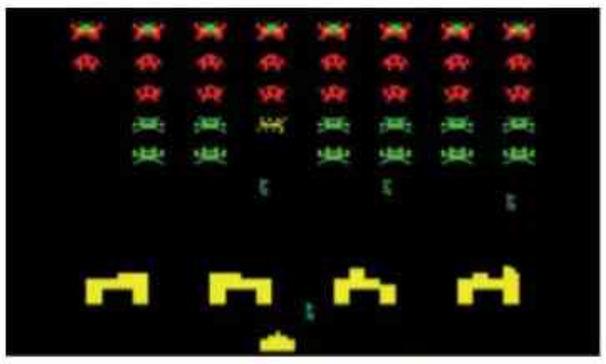
Arguably the best *Space Invaders* sequel, *Extreme* is probably what Nishikado has in mind when he says: "I think that shooting games have become too difficult and too centred on catering to enthusiasts."

SPACE INVADERS GET EVEN (Wii, 2008)

This recently released WiiWare exclusive turns the *Space Invaders* principle upside-down by putting the player in control of the Invaders, with the objective being to complete a successful invasion of Earth.

Attack of the Clones

How many times will we get away with using variations on the same pun?

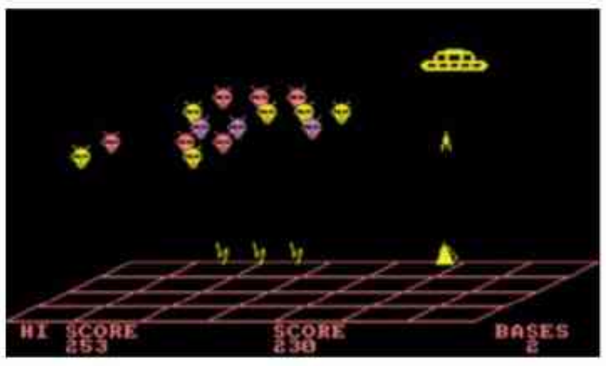


INVADERS (BBC MICRO, 1982)

IJK Software's *Invaders* was one of the earliest computer format clones of Taito's international hit. Monochrome and colour versions were released (the latter only for Model B computers).

AVENGER (C64, 1982)

Another early attempt at bringing *Space Invaders* home was Commodore's *Avenger*, which managed to reproduce the coin-op's formula with only a minimum of cuts and compromises.



3D INVADERS (CPC, 1984)

More 'quasi-isometric' than three-dimensional, this effort at replicating/improving the original *Space Invaders* formula really struggles to imitate the playability of Nishikado's game.

PEPSI INVADERS (ATARI 2600, 1983)

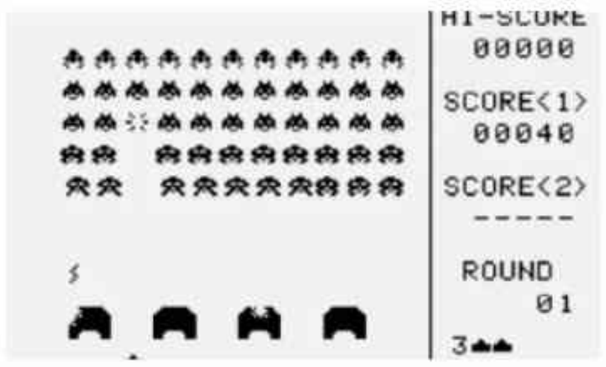
This limited-run promotional 'advergame', commissioned as you might guess by Coca-Cola, replaces *Space Invaders*' alien enemies with the letters P, E, P, S and I. Very clever, that.

SPACE INVADERS: FUKKATSU NO HI (PC ENGINE, 1990)

This great PC Engine conversion also includes a 'New Version' of the game, where the protective bases are removed as your ship gains the assistance of a shield.

CHICKEN INVADERS (PC, 1999)

Chicken Invaders is a 1999 vintage poultry-based clone of *Space Invaders*, complete with eggs and drumsticks in lieu of laser fire. As it's freeware, you might like to give this game a shot. Don't be a chicken, etc.

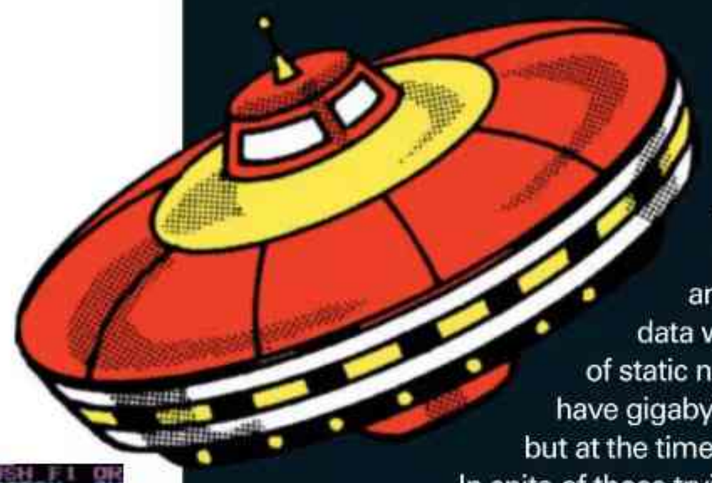


SPACE INVADERS (WONDERSWAN, 1999)

This port of *Space Invaders* for Bandai's WonderSwan handheld replicates Nishikado's original work, only inverted as black sprites on a clear background.

SWEET INVADERS (MOBILE, 2006)

In one of the least imaginative and most shameful conversions of *Space Invaders*, 2006's *Sweet Invaders* 'innovates' by displaying bitty 'stunners' in the background of its 'erotic' take on the game.



the program area, but the performance was very bad and I remember occasions when data would become corrupt because of static noise. Nowadays, developers have gigabytes of memory to work with, but at the time I only had kilobytes…"

In spite of those trying limitations, Nishikado must have realised that he had a hit on his hands when groups of Taito employees began gathering at his desk for a go on the prototype version. "Once the game was close to being finished, quite a few people from [Taito's] development division were so pleased with it they began to play it regularly," he smiles. "However, because they were playing *Space Invaders* using my development tools, I wasn't able to get any work done while they were playing, which bothered me a lot. Having said that, although I developed *Space Invaders* alone, I think that in the end it was improved and perfected thanks to consultation with the people who were playing the game around me."

While the floor-level workers at Taito were rightly impressed with *Space Invaders* and were the first people in the world to become hooked on it, the 'Suits' were, according to Nishikado, a picture of doubt and scepticism: "In those days I was given complete freedom to work on games as I saw fit, so at the start of the project no one expressed any opposition to the idea. Along the way, though, I had to explain – mostly to businesspeople and salespersons – the game's shooting system and how there was nothing else to compare it with at that point. I had to outline how being invaded by these aliens would result in a game over, how enemies would shoot at the player and so on. That was difficult; they generally didn't give *Space Invaders* a good evaluation – they didn't seem to rate it very highly."

Part of the execs and salespersons' problem with the game was that it did something unusual; something they either couldn't comprehend or simply didn't see as an appealing factor in a project they were backing: "Up until *Space Invaders*, shooting games didn't feature enemies that would attack the player," Nishikado explains. But that wasn't the only feature that met with doubting voices: "Also, even if you still had missiles remaining, if the Invaders got to the bottom of the screen and successfully carried out their invasion, it would result in a game over. To tell you the truth, both of these features were vehemently opposed by the sales and businesspeople…"

The final build of *Space Invaders* satisfied its creator to an extent, but Nishikado had some regrets even as soon as the game was in the wilds of Japan's 'game centres' (the places we'd call arcades). "The capabilities of the *Space Invaders* arcade hardware were really low," Nishikado sighs. "I wanted to produce colourful images, but it just wasn't possible with that hardware – so as soon as the game was complete, I began to develop a plan for new high-level hardware." Initially, that wasn't possible, so the game appeared in monochrome form. Eventually, Taito came up with an ingenious solution that went some way towards placating Nishikado's desire for a colourful game: multicoloured cellophane screen overlays were placed over the displays of existing cabinets. Over in the States, Bally/Midway would pull the same trick with its upright cabinet.

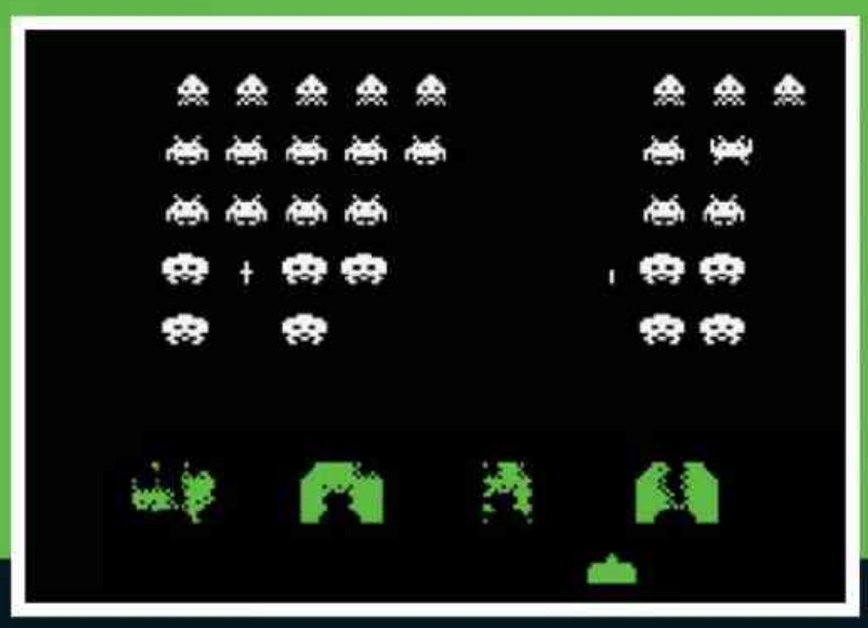
While *Space Invaders* was by no means a rushed job – in spite of completing work on the game in just 12 months, Nishikado was not working to a set deadline as such – the limitations of the technology at his disposal meant the final build was not quite where he wanted it to be: "For one thing," says Nishikado, "I really wanted to include a feature in the original *Space Invaders* where the Invaders would split up and form groups… but at least this ended up appearing in *Space Invaders Part II*."

If Nishikado was slightly unimpressed by his own production, the same could not be said of Japan's population at large.

» *Space Invaders*' clear outline of its high-score system ensured that players would try to play cleverly and keep on returning.

"Businesspeople and salespersons ... generally didn't give Space Invaders a good evaluation – they didn't seem to rate it very highly"

THE SUITS COULDN'T SEE A GLOBAL HIT EVEN IF TOMOHIRO NISHIKADO DEMONSTRATED AND EXPLAINED IT TO THEM



» Tomohiro Nishikado's work remains relevant 37 years on from its conception, marking the game out to be, what we already knew, one of the greatest ever to grace our planet.

DEVELOPER HIGHLIGHTS

» SPEED RACE DX
SYSTEM: ARCADE
YEAR: 1975

» SPACE INVADERS PART II
(PICTURED)
SYSTEM: ARCADE
YEAR: 1979

» LUNAR RESCUE
SYSTEM: ARCADE
YEAR: 1979

Tapping into the tremendous local interest in science fiction, *Space Invaders* was very much of its time – a 1978 vintage game for the inhabitants of Japan in 1978. The coin-op was an instant hit, zapping games right into the core of Japanese culture and even reportedly causing a shortage of 100-yen coins as a by-product of its phenomenal success. When we mention this myth/legend to Nishikado, he seems like he wants to laugh it off as a fanciful exaggeration, but it definitely holds an element of truth, as he concedes: "The effect of *Space Invaders* was certainly noted among businesses using 100-yen coins a lot, but I don't know whether the coins actually became less common because of the game..."

Nishikado can't take credit for the housing of his PCB, mind, as he had nothing to do with the coin-op cabinet's design: "The cabinet was designed and produced by a separate team," he says. Like the Western versions of *Space Invaders* manufactured by Bally/Midway, Taito's Japanese *Space Invaders* cabinets were eventually presented in different flavours – some upright machines, some in a cocktail-table style. After some comparison work, Taito's preference was for the table format, as Nishikado relates: "Originally, the cabinet was intended as an upright design. The table-type cabinet saved a lot of space, though, so that version ended up supplanting the upright model." *T.T. Space Invaders*, as it was dubbed by Taito in Japan, was a sensationally popular machine. Later on, however, Taito would release an upgraded version of the upright, which would ultimately prove to have a longer life in Japan's quickly changing game centres. The later addition of proper colour graphics (a notable improvement on the 'black-and-white graphics with colour overlay' solution) cemented *Space Invaders*' place as a 'safe bet' in bars, game centres and other locations.

The legacy left by *Space Invaders* is so immense and multi-branched that it's almost impossible to quantify the game's influence on the world. It has appeared in countless TV shows, either by way of a passing reference or as a central theme; it has provided the impetus for numerous musical projects (search Google Images for the sleeve to 1981 dub LP *Scientist Meets the Space Invaders*); it has even inspired artistic movements. Yet in Japan, the game itself was – like most trends here, it has to be said – a relatively short-lived phenomenon. On the one hand, Nishikado reckons: "Sales of *Space Invaders* were really much higher than I had anticipated." But on the other, matter of factly, he tells us: "The following year, once sales of the game had started to decline, I was asked to produce *Part II*, which I developed dutifully, but it wasn't such a big hit [as the original]."

1978 was a hugely significant year for Taito and games in Japan in general, but in terms of the volume of notable games, it would be superseded year on year thereafter. As early as 1979, Nishikado was seeing his compatriots gaining ground, even if much of the basis for their successes had been laid by *Space Invaders* and what Japan collectively termed the 'invader game' boom: "When I saw how smooth the movement was in Namco's *Galaxian* – and how colourful it was, too – I remember thinking *Space Invaders* had lost [the battle]. There were many shooting games that used *Space Invaders* as a basis after that," Nishikado concludes, although he doesn't sound at all bitter about that situation. Without *Space Invaders*, there's a chance that Japanese shoot-'em-ups would not have developed, or at least not in the amazing way they did during the 1980s and 1990s. It's not merely Taito that owes Nishikado a (metaphorical) debt, but also the other Japanese developers (Namco with *Galaxian* included) who took inspiration from *Space Invaders* and, on a global scale, the millions of people whose first experience of the power of videogames was the heroic act of saving the Earth from invasion by pesky aliens who were wont to scuttle their way towards the planet's surface.

Nishikado isn't keen on the latest examples of shooting games – "In recent years, I think that such games have become too difficult and too centred on catering to enthusiasts," he tells us – but he remains committed to the enduring phenomenon that began in his office at Taito in early 1978: "I still want to make simple shooting games," he smiles.

STAGE 3
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23456
CRED
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Golden Axe

IF ONLY ALL JOURNEYS WERE THIS FANTASTIC

» SEGA
» ARCADE
» 1989

Golden Axe is a strange game. It's not the greatest side-scrolling beat-'em-up ever made, and it rips off plenty of other superb titles, but good grief, is it fun to play through. After all, what other game from the era allowed you to carve up skeletons, ride around on mythical creatures and cast powerful magic? None, that's what.

While the likes of *Rastan* and *Rygar* featured a similar theme neither contained the fantastical environments that *Golden Axe* boasted. Indeed, in the half hour it took me to complete the game (I've still got the magic touch) I visited a besieged village, journeyed across the back of a giant turtle, before finally flying to Death Adder's domain via a gigantic flying eagle. Quite a journey I'm sure you'll agree.

The enemies you face are no less exotic and consist of Harryhausen-styled skeletons (some of the hardest foes in the game by the way) mace-wielding giants, busty Amazonians and gigantic, armour-clad knights that carry swords longer than your actual character. Yikes! Then, of course, there's the final showdown with old Death Adder himself: a huge monstrosity of a man who wields the titular Golden Axe.

Your able warriors, the stout Dwarf Gilius Thunderhead, beefy barbarian Ax Battler and the sexy Tyris Flare are more than able to deal with Death Adder's minions, and if you get bored of hacking them up with swords and axes you can always hop on the back of one of *Golden Axe*'s many mythical beasties and smoke 'em with a handy fireball. If all else fails then there's your magic potions to rely on. Each warrior favours a certain element: lightning for Gilius, earth for Ax and fire for Tyris, which can be powered up by kicking the occasional pixie in the arse and grabbing it's dropped potion. Who says crime doesn't pay? When your gauge is finally filled you can let rip with anything from a minor earthquake to summoning this big fella on the right. I love the smell of burning Death Adder in the morning...

INSERT COIN(S)
PUSH 2P START

THE LEGACY OF DRAGON'S LAIR

Cinematronic's Dragon's Lair remains one of the most iconic arcade games of all time and has been released for almost every computer and console platform under the sun. As the classic arcade game enters its third decade, Martyn Carroll unravels the tangled history of Dirk's daring adventure

***Dragon's Lair* is the most divisive of games. For some, it doesn't even deserve to be called a game, as it's essentially an interactive movie where the player does little more than prod Dirk away from danger. For others, the title alone is enough to excite the synapses and whisk them back to 1983 when goggle-eyed gamers bumped and jostled to get a glimpse of this extravagant new game that featured cartoon-quality sound and animation. For those amazed by the attract mode, amused by Dirk's screams and confused by Daphne's one-piece when the game first arrived in arcades 32 years ago, there will always be something special – magical, even – about *Dragon's Lair*.**

While fans are quick to argue that *Dragon's Lair* is more than just a movie, the title has certainly benefited from the type of bonus material you'd find attached to treasured films. Releases on CD, DVD and more recently HD-DVD and Blu-ray have featured mini-documentaries and interviews with the creators along with deleted scenes and other extras. As such, the story of how *Dragon's Lair* came together is rather well known, but it's worth recapping simply because the game's origins are so surprisingly primitive.

The concept was first developed by Rick Dyer in 1979. Having quit his job at Mattel, where he developed handheld LCD games, Rick set up Advanced Micro Computers in San Diego. Working out of his garage, he created a fantasy-themed adventure game that used a roll of cash register paper as its 'display'. On the paper Rick added various scenes, each with a hand-drawn picture and a text description. The player would choose their desired multiple-choice option and the computer would quickly spin the roll to display the required scene.

Rick went on to replace the paper roll with a strip of film, then added sound via a tape recorder, and later still transferred his adventure game to a LaserDisc. This new technology allowed him to randomly and almost seamlessly jump between scenes, but he was still using static images. The whole thing was a bit flat. He needed to breathe life into it, and having seen the animated feature *The Secret Of NIMH* at the cinema, he knew who he wanted to do just that.

The Secret Of NIMH was the first film from LA-based Don Bluth Productions, the studio formed by Don Bluth, Gary Goldman and John Pomeroy following their well-publicised resignation from Walt Disney Productions. Life as an indie was hard however. *NIMH* opened to limited success in June 1982 and production of the second film was derailed by industry-wide strike action. ▶

Picking up the story, Gary Goldman says: "We suffered a union strike at the end of July. Our crew of about 110 artists and technicians were reluctantly escorted from the studio. That strike lasted 73 days and during that time, our investors, concerned about the ramifications to the budget, decided to back out. Don, John, our production manager, our receptionist and I were the only ones left in the building. We thought our company was done. Two months into the strike we were contacted by Rick Dyer. He came to the studio and pitched his idea of us partnering with him to make an animated LaserDisc arcade game. He had seen *The Secret Of NIMH* with his wife and told her that we had to be the ones to produce the animation. So, even though we didn't really know anything about games, we agreed to join him in the adventure – videogames were not in union contract at that time. There was a sigh of relief among us regarding our destiny as a company."

Relief quickly turned to panic as team Bluth had just 16 weeks to create something that could be demonstrated at the Amusement Operators Expo being held in Chicago in March 1983. Rick Dyer knew that other companies were developing LaserDisc games so they needed to be first to market, in the US at least. That frantic four month period witnessed the creation of Dirk the bumbler, Daphne the beauty, the castle, the quest, the pitfalls and pratfalls. Hundreds of ideas were turned into thousands of drawings as *Dragon's Lair* came to life.

March arrived and the team had three scenes (or 'rooms') ready to show off at the expo. And show off they did. "We couldn't believe it," says Gary. "*Dragon's Lair* became a national name. All the news stations across the nation reported on the convention, showing colour footage of the gameplay. The distributor, Cinematronics, was able to pre-sell more than 3,500 units of the unfinished game. All of the costs for production, programming and game cabinet construction and shipping were paid for with advances on those sales."

Reaction to the game was unanimously positive. A typical viewpoint appeared in the July 1983 issue of *Video Games Magazine*. "The 1983 AOE offered very little we haven't all seen before," reported John Holmstom on the expo. "Most of the new games were variations on recognisable and overused themes which aren't going to shake up many arcades. Only one game stood out from the rest – *Dragon's Lair*. It's such a revolutionary concept that it will undoubtedly cause a great deal of excitement in the arcades. It could ultimately make the other games at the show seem like mere antiques."

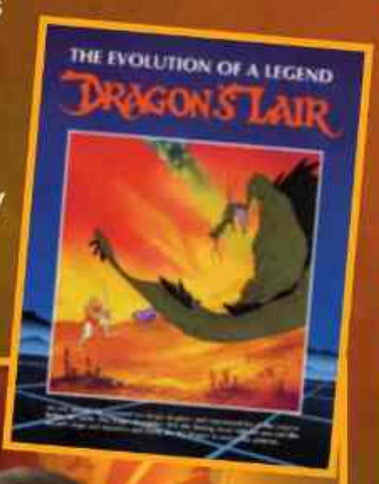
Buoyed by the success and with completion costs covered, the team returned to California to finish work on the game. In total the project would feature around 20 minutes of hand-drawn animation. "We completed it in May," continues Gary. "Rick Dyer started testing it in arcade situations, making changes and excluding rooms that didn't entertain or confused the players. He also tweaked the programming 'event' windows – the amount of time allowed to make your move. The game started shipping to arcades in early July, selling in excess of 8,000 machines." ▶

» Could someone give me a hand here?

READERS REMEMBER

■ "I first saw it in the arcade that was tacked onto the side of my local Odeon cinema. I was utterly blown away by it. I must have stood there and watched that attract sequence about 20 times and knew the voiceover off by heart. I didn't play it because it was expensive and I wanted to buy sweets, so at that point it was the best game ever too me. Obviously when I did eventually play it I realised otherwise, but for a while that game was just magical."

THE LAIRD



» Creators of a legend. From left to right: Don Bluth, Rick Dyer and Gary Goldman.

» The animation in *Dragon's Lair* still looks lovely.

» Poor old Dirk faced all sorts of deadly encounters.

DRAGON'S SPAWN

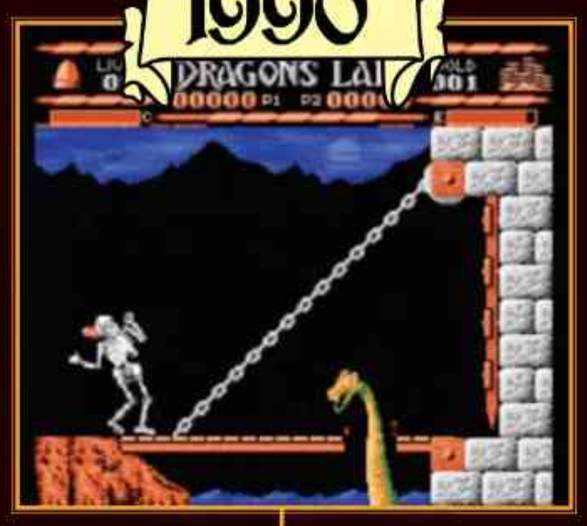
Sequels to – and spin-offs from – the original arcade game

1984

SPACE ACE (Arcade)

■ This delightful follow-up to *Dragon's Lair* is faster (it's relentless) and funnier (thanks to the introduction of dialogue). Branching paths and varying skill levels increase replay value. It's regularly bundled with the *Dragon's Lair* arcade games, creating a loose trilogy.

1990



DRAGON'S LAIR (NES)

■ Elite's first attempt at dropping Dirk into a platform game was a disaster. The character graphics are detailed and large, but the animation is sluggish and the controls are clunky. The difficulty level is crazy; you deserve a medal for finishing the first screen.

1991

DRAGON'S LAIR (GB)

■ Subtitled *The Legend*, this handheld spin-off is a straight rip of Spectrum platformer *Roller Coaster*, also by Elite. It helps that the source is a brilliant little game, but no real effort has been made to link the game to the *Dragon's Lair* world. Bizarre.

1993

DRAGON'S LAIR (SNES)

■ Third time lucky for Elite. This platformer is hardly groundbreaking, particularly within the SNES library, but it's polished and engaging and lots of fun. It's challenging too, though fair, and there are plenty of nods to the original arcade game to spot.

1991

DRAGON'S LAIR II (Arcade)

■ This belated sequel arrived in arcades seven years late – and it was probably seven years *too* late. For fans though there's real magic at work here. The animation is top drawer, with proceedings taking a surreal turn as Dirk is whisked through time.

2002

DRAGON'S LAIR 3D (Multi)

■ Part sequel, part update, this return to the world of *Dragon's Lair* is not unwelcome. It plays it safe, adopting the typical action-adventure-platformer approach, but the cel-shaded visuals are spot-on and the animation is authentic. A 'nice' game.

2004

DRAGON'S LAIR III (PC)

■ Mark this as a failed experiment. It's basically *Dragon's Lair 3D* turned into an interactive movie so that the gameplay matches that of the original. A definite whiff of 'Why bother?' makes this one for completionists, or possibly masochists.

» Beware the Mudmen. Things are about to really heat up.

CARTOON TIME

■ Cartoon serials based on hit videogames have occupied Saturday morning TV schedules for years, stretching right back to the early Eighties. *Dragon's Lair* was a better fit than most, being based on a game that actually boasted traditional animation itself. Ruby-Spears Productions developed 13 episodes that were initially broadcast on the American ABC network between September 1984 and April 1985.

In each 30-minute show, Dirk (who now spoke rather than just shrieked) would rescue Daphne or protect the kingdom from Singe the dragon and his conniving cronies. The animation was adequate, the stories were diverting and the whole thing was good fun – providing you were eight years old. Co-creator Gary Goldman singles out the series as the one the main reasons why *Dragon's Lair* remained in the public consciousness long after the game's popularity had cooled in the arcades.

The show has been re-run several times on US television over the years and in 2011 Warner Bros released the complete series on Region 1 DVD.

READERS REMEMBER

■ "I remember seeing it when I was but a youngster and being amazed at the graphics (compared to anything else in the arcade at the time). The kid I was watching must have played it to death, as it seemed I was watching a full cartoon. I thought it was easy. I popped my coins in and lasted about ten seconds... Didn't play it much after that."

NOKGOD

During that summer of '83 it seemed that everyone was playing – or at least standing in line waiting to play – *Dragon's Lair*. It was massively popular. Operators plonked TVs on top of machines so that punters could more easily watch the game being played. The fact that it cost twice as much to play as other machines (fifty cents per credit in the US, rather than the usual quarter, to cover the increased outlay for the LaserDisc technology) didn't dampen the enthusiasm.

"We were awestruck," admits Gary. "Not only by the results of the Chicago convention preview, but by visiting the arcades in the LA area. It was kind of crazy, seeing the crowds around the machine. We were invited to come to The Largest Arcade in the World in Denver, Colorado, where they had the game, spot lit, all alone, separated from the other games with a red carpet and gold-coloured ropes for the players to line up to play. They had put three TV monitors on the top of the arcade allowing the crowds of kids to watch the action from several directions. There were at least 75 to 100 players standing in line waiting to play. It was like the lines to see *Raiders Of The Lost Ark*."

One of those waiting impatiently in the line for *Dragon's Lair* was Jeff Kinder. "I was on vacation with my family in Wildwood, New Jersey," says Jeff, who years later would establish a *Dragon's Lair* website. "As I walked around an arcade I noticed a huge crowd around one of the games. A TV that was sitting on top of the machine and when I saw the screen I said to myself 'That's nice, they're showing cartoons on the TV'. When I finally edged through the crowd and saw that those cartoons were actually part of the game I just couldn't believe it. My jaw hit the floor. After waiting 15 minutes for my turn, my game lasted about 15 seconds. But I was hooked."

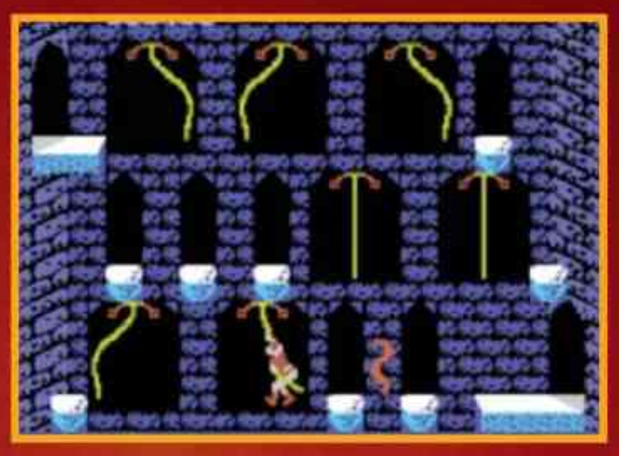
Someone else clamouring to play was Martin Touhey. Spellbound by the game as a wide-eyed nine-year-old, he's currently putting together a feature-length documentary entitled *Inside The Dragon's Lair*. "I walked into the arcade one day and a crowd of people were all huddled around this one game," he says. "My young brain could barely even comprehend what was going on. Two of my favourite things, animation and videogames, coming together in such harmony that it felt like a wish come true. I was in a state of euphoria and I hadn't even played the game yet. Once I did get to play the game, however, it did to me what it did to many other gamers – it took my fifty cents and killed me quickly. My attraction wasn't diminished though. It was such a different concept at the time that there was no way I could ever forget it."

The game was a success for all parties involved. Don Bluth Productions, who initially viewed *Dragon's Lair* as a stop gap between movie projects, ploughed the

» Despite the limitations of the platform, this remained an impressive conversion that captured the spirit of the original game.

» At least when you die you're rewarded with a funny fatality scene. Get used to it as you'll see it often.

» Coleco's original *Dragon's Lair* adaptation for its Adam home computer.



» Against the odds, the Commodore Amiga version delivered an authentic *Dragon's Lair* experience.

» *Dragon's Lair* may have had simple gameplay, but it looked amazing.

profits into videogame development. Its second LaserDisc game, the sci-fi romp *Space Ace*, arrived in 1984 and this was followed by a *Dragon's Lair* sequel. Gary says: "The money flowed and the profits funded *Space Ace* and 70 per cent of *Dragon's Lair II*." 70 per cent? In March 1984, distributor Cinematronics pulled the plug on the sequel despite it being close to completion. It appeared that the novelty of LaserDisc games had rapidly worn off and their popularity was on the wane. The craze was short-lived and it pretty much began and ended with *Dragon's Lair*. Yet the game's legacy was to live on.

Hit coin-ops end up in the home and *Dragon's Lair* was no different, despite it being impossible to convert the game to the computers and consoles of the time with any degree of accuracy.

Mere insurmountable tasks weren't about to stop Coleco however. The manufacturer was planning an add-on module for its ColecoVision console that would play CED discs (effectively vinyl records that stored video). *Dragon's Lair* was the perfect killer app for this new kit and Coleco reportedly stumped up $2m to licence the game. Unsurprisingly, plans for this ambitious add-on were soon scrapped and Coleco was forced to adapt rather than convert the game. The result was a multi-load affair for its Adam computer that featured scaled-down versions or rather interpretations of popular scenes from the original. The game was released in 1984 and available on both cassette (that cleverly pre-loaded the next level while you were playing the current one) and floppy disk.

The Adam was not a popular computer, so it was left to UK firm Software Projects to give Coleco's version greater exposure. Software Projects boss Alan Maton picked up the Adam version while on holiday in France and brought it back to show his team in Liverpool. "Software Projects had the Adam version and we were all looking at it," recalls in-house programmer John Darnell. "I had written a Commodore 64 turbo loader and saw that just as the Adam loaded the next level from tape whilst playing the game, the C64 could potentially do the same. 'Go for it,' said Alan. 'We will sort out the copyright issues.' And so that's what we did! Writing *Dragon's Lair* for the C64 was an absolute blast."

John's C64 version was released in late 1986, with Spectrum and Amstrad CPC versions following a few months later. Review scores were so-so, with many critics bemoaning the game's tough-as-boots difficulty level, but the allure of *Dragon's Lair* was still strong and the game was a solid chart hit. In 1987 Software Projects created a fresh set of levels based on arcade scenes not featured in the Adam original and released it on C64, Spectrum and CPC as *Dragon's Lair Part II: Escape From Singe's Castle*. A 'new' plot involved Dirk venturing back into the castle to steal some of Singe's gold – presumably to keep Princess Daphne in the pre-kidnap lifestyle she was accustomed to.

In 1988, Randy Linden and David Foster of US publisher ReadySoft acquired the rights. Their plan was admirably bold – to release a faithful version of *Dragon's Lair* for the Amiga computer. The lengthy process involved separating the foreground elements from scenes with static backgrounds and then reducing the colours used in these elements (to 16) and compressing them. Having minimised the data, they tackled the ▶

READERS REMEMBER

■ "When this came out, I couldn't believe my eyes. It was expensive but I had to have a go. I died almost instantly and never played it again having felt utterly cheated out of my pocket money. I just watched everyone else waste their money instead!"

FREDGHOSTMASTER

"WE FIRST RELEASED THE AMIGA VERSION AT THE WORLD OF COMMODORE EVENT AND WE HAD TO KEEP RUNNING BACK TO THE OFFICE TO GET MORE STOCK"

READYSOFT'S DAVID FOSTER

» The visuals were cartoon-like, but not a patch on the arcade original.

»*Dragon's Lair* was released on various high definition formats, meaning anything with a remote can play the iconic game.

challenge of optimising processor usage and maximising disk space. The finished product shipped on six full-to-the-brim floppy disks and yet featured just 15 per cent of the arcade game.

It was a huge hit regardless. "We couldn't produce them fast enough to meet the demand," says David. "We first released the Amiga version at the World of Commodore event in Toronto in December 1988 and we had to keep running back to the office to get more stock. We ended up selling more than 1,000 units at the show alone. In the first three months we produced 60,000 units, times six disks each. We had a custom disk format designed to fit more data on each disk and also thwart piracy, so we were going flat out copying disks on reworked Amiga external drives with the rotation speed tuned down. The drives kept breaking down and we would have to keep buying new ones."

READERS REMEMBER

■ "I was completely mesmerised by *Dragon's Lair* and loved the intro, but then again I was only around six or seven years old when I first saw it and never had the chance to play it. Back then I thought what I was seeing was actual game graphics rather than just stock footage running off a LaserDisc."

TOXIEDOGG

Following its successful debut on the Amiga, versions for the ST, PC and Mac were released. ReadySoft then converted a second set of scenes and, like Software Projects, released them with the subtitle *Escape From Singe's Castle*. For Dirk's return, ReadySoft introduced some player aids in the form of three difficulty levels, save game slots and clearer on-screen hints. "I think the helpers make the game much more accessible to casual gamers," says David. "We have found that most of our customers are interested in getting through the game and seeing all of the animation, bringing back the memories,

» Software Project captured the essence of *Dragon's Lair*, but not the visuals

and not so much having to memorise all the exact moves and timings. We make sure that the helpers can be turned off for those interested in the true *Dragon's Lair* experience." The game also included several new scenes designed in-house at ReadySoft.

The brisk sales of these home versions demonstrated that *Dragon's Lair* still resonated with gamers. It wasn't too surprising then when interest was shown in the partially completed sequel. Leland Corporation approached the Bluth team and offered to finance the completion, and in 1991 *Dragon's Lair II: Time Warp* finally arrived in arcades. "I'm not sure

> "THE PHENOMENON IS THAT IT WAS A HISTORIC AND MEMORABLE MOMENT IN THE LIVES OF THOSE WHO SAW IT WHEN IT FIRST APPEARED IN THE ARCADES"
>
> CO-CREATOR GARY GOLDMAN

DRAGON'S LEGACY

Seven games that owe a debt of gratitude to Dragon's Lair

SUPER DON QUIX-OTE

■ Following the success of *Dragon's Lair*, a number of coin-op manufacturers flirted with LaserDisc tech. This was the first – and only – release from Japanese developer Universal. While the animation is far from Bluth standard, it's very similar to *Dragon's Lair* in story and execution. There's one difference however – the video display is overlaid with graphics showing your score, lives etc. Hints are also displayed, reducing instances of trial and error.

COBRA COMMAND

■ Perhaps best known as an early Mega-CD FMV game, Data East's *Cobra Command* was actually released in arcades in 1984. Gameplay is a mix of shooting enemy craft and rapidly following directional commands which are relayed over the chopper's radio by your officer. The animation from the Toei studio is great and the action barely lets up for a second. Forms a fantastic double-bill with the 1985 car chase epic *Road Blaster* (*Road Avenger*).

MAD DOG MCREE

■ This light-gun game sees you shooting no-good troublemakers in a Wild West town. Featuring video footage of real actors delivering terrible lines in hackneyed situations, the actual gameplay boils down to the reflexive type first introduced in *Dragon's Lair*. Enemies appear on the screen and if you're fast with your aim, they hit the dust. Too hesitant and it's a trip to Boot Hill for you. Very silly but fun nonetheless, particularly in the arcade with a crowd of mates rooting for you.

what went into Leland's decision," says David, "but I would imagine that the home market success of *Dragon's Lair* played into it." Interestingly, the trailer to *Time Warp* displays the note 'Licensed exclusively to Nintendo', yet Gary cannot recall the Japanese firm being involved.

ReadySoft converted the arcade sequel to home computers, and was once again forced to leave many scenes out. Some of these unused scenes were picked up and used in a new release confusingly titled *Dragon's Lair III: The Curse Of Mordread*. As with *Escape From Singe's Castle*, this 'third' title included some exclusive new scenes to help make sense of the story. David says: "We needed a new beginning and ending when we went back and made subsequent versions based on the same material, so we made our own. I suspect that technically we did need approval for this and I'm not sure if that was ever requested or received, but I do recall that the Bluth Group was quite hands-off at the time. Its interest was in feature movies and the *Dragon's Lair* rights were a sideline."

It would appear that Don and his partners weren't too protective of the rights if Elite's trio of *Dragon's Lair* games for Nintendo consoles are anything to ▶

» Dirk's mother-in-law is not best pleased that Daphne has been kidnapped. Again.

READERS REMEMBER

■ "I saw it in Porthcawl and there were always big queues around it. There were two guys who were always on it and could complete it on one credit and it was probably the best game ever to a young me.

Because of that, I've got a weird fondness for *Dragon's Lair* and have picked up quite a lot of the home versions over the years. I actually quite like the SNES platformer, the original GB version is a decent version of *Roller Coaster* and I also really enjoyed *Dragon's Lair 3D* (which is what the original game should have been and might have been if they'd had the technology at the time) on the PS2."

SHINOBI

» *Dragon's Lair 2: Time Warp* saw Dirk constantly zipping through time.

» Software Projects experienced much-needed success with its *Dragon's Lair* conversion.

ANOTHER WORLD

■ Eric Chahi's 16-bit classic has more in common with *Dragon's Lair* than you may at first think. How do you escape the tentacles at the beginning of the game? You push up. How do you reach the teleporter at the end of the game? You push left. In addition, both games dwell rather lovingly on death, and perversely it's often fun to get killed in a variety of ways just so you can witness the inventive fatality sequences.

BRAIN DEAD 13

■ Having spent a number of years successfully converting the *Dragon's Lair* games to home formats, ReadySoft put the ports on hold and developed this original interactive movie for home systems. Predictably the game borrows very heavily from *Dragon's Lair*, with the usual button prompts advancing the story, but the quirky animation and delightfully dark plot help the game stand on its own two feet. Also, as a bonus, some of the death scenes are bleakly hilarious.

SHENMUE

■ It would be rather foolish to call Sega's *Shenmue* derivative outright, yet one of its key features – Quick-Time Events – can be traced directly back to *Dragon's Lair* and the other interactive movies of the era (via 1996's *Die Hard Arcade* which dabbled with timed button prompts during cutscenes). While *Shenmue*'s QTEs are just a small part of an innovative masterwork, some would argue that this 'feature' has been a blight on gaming ever since.

HEAVY RAIN

■ Beautiful, tragic, compelling, exhilarating. It's easy to go overboard with the adjectives when discussing *Heavy Rain*, the stunning noir-inspired PS3 game from Quantic Dream. What's really amazing though is that the game, in which the player has no direct control over characters and the action is affected by timed events, shouldn't really work in this day in age. Yet it does, brilliantly, as proved by the game's wide critical claim and strong commercial success.

go by. The NES (1990), Game Boy (1991) and SNES (1993) releases were all platform games far removed from the arcade original. Much more faithful were the CD-ROM versions which ReadySoft rolled out from 1993 onwards. These finally provided PC and Mac users, as well as owners of jazzy CD-equipped consoles like the Mega-CD, CDi and 3DO, with the closest thing yet to the full arcade experience at home (if you excused the slightly ropey Cinepak-era video quality).

In 1997, Digital Leisure (the new name for ReadySoft) released versions of *Dragon's Lair* with vastly improved video for CD and DVD. This year also saw the launch of Jeff Kinder's LaserDisc gaming website, which he initially created to document the restoration of a battered *Dragon's Lair* arcade machine that he'd bought. "I was so excited to finally be able to own one of my all-time favourite games," says Jeff about the machine. "Since the cabinet was in really bad shape, I figured I could rebuild the cabinet with new wood and restore it back to its original condition. As I worked on this project, I took pictures and put them on the internet to show others my progress. After a month or so, I started getting tons of emails from people commending my work and asking if I knew where they could find a *Dragon's Lair* machine or if I had any other information about the game or other LaserDisc games. Back in 1997 there was very little information about LaserDisc game on the internet, so I started doing research and making connections with people who had other games. Over a short period of time, many of these people started helping me and the popularity of the site really exploded."

Dragon's Lair was very much a product of the Eighties, yet its mysterious indefinable showed no sign of waning with the arrival of the new millennium. In 2001, Capcom published a surprisingly faithful version for the Game Boy Color, and then in 2002 Ubisoft readied an all-new Dirk adventure for PC and home consoles. Titled *Dragon's Lair 3D*, the gameplay was updated to give players direct control over Dirk, while the distinctive look of the original was replicated.

"We used source material from the original *Dragon's Lair* to help us apply the look to the 3D version," says project director and lead animator Thomas Konkol. "We were very lucky to have access to the original backgrounds and some animation cells." These were provided by the original co-creators who had a hand in the development. "They were very helpful in providing original art assets, giving us creative art direction, and on occasion, visiting the studio to assist and answer questions. I remember Don Bluth came by my office and looked at the 3D Daphne model I was creating and gave me very helpful advice on how to adjust her proportions to make the model look more like the 2D animated version."

In 2006 the focus returned to the original game with the first HD release from Digital Leisure. This proved to be painstaking work for David Foster and his team. He says: "We went back to the original film that had been in a vault for 20 years and had it transferred to a digital format in

» This version was started by Derrick Rowson and finished by Paul Hodgson and Andy Walker.

READERS REMEMBER

■ "One of the video rental shops in town had a bunch of arcade machines, and one day I was there I saw this amazing game people were crowding around. It was truly a thing of beauty, and I dearly want that *Dragon's Lair* film to happen."

NORTHWAY

"THERE WERE AT LEAST 75 TO 100 PLAYERS STANDING IN LINE WAITING TO PLAY. IT WAS LIKE THE LINES TO SEE RAIDERS OF THE LOST ARK"

CO-CREATOR GARY GOLDMAN

» The ambitious sequel put Dirk into even more precarious situations.

» Constant conversions over the years has ensured *Dragon's Lair* continues to strike a chord with gamers.

HD. Although it was great resolution it showed up all kinds of dust, hair and other artefacts that weren't particularly visible in SD but were glaring in HD. So we ended up spending six month doing hand touch-up on a frame-by-frame basis to tidy up the video, but we ultimately had a much cleaner version which looked great in HD."

This HD print has been used in subsequent releases for many platforms including Wii, PlayStation 3, Xbox 360, iOS and Android. So what next for the original *Dragon's Lair*? A 3D version? A 4K version? "We always have *Dragon's Lair* plans in the pipeline," says David. "However, we're sticking with the core game. We've discovered that this is what fans want the most. If a *Dragon's Lair* feature film was ever produced then there might be interest in a movie-themed version of the game."

Talk of a *Dragon's Lair* movie has circulated for many years. Over to Gary Goldman: "It's still on our list of feature films we want to make. We've probably done twelve rewrites on the script. It isn't about the game. It's the backstory about Dirk, Daphne, their history. It's a prequel to the game."

READERS REMEMBER

■ "I saw a massive crowd around a machine, and once I fought my way to the front I saw the most spectacular game I'd ever seen! Literally a cartoon! If only it wasn't so ruthlessly difficult I'd have played it. I also think it was the first ever game that cost 50p a credit. Shocking in the days of 10p machines!"

FREESTYLER

The polarising effect of *Dragon's Lair* might be the reason why a question mark hangs over the movie. But then, even those that hate the game and wish they'd never wasted a single credit on it must surely appreciate its groundbreaking impact and admire its 32 year legacy.

"It's the animation," says Gary, when asked about the game's timeless appeal. "It's well executed and still entertaining, even to the children of those who played it during the Eighties. It's not a great game, it's a memory game. I think the phenomenon is that it was a historic and memorable moment in the lives of those who saw it when it first appeared in the arcades. It's one of those first-time experiences that takes place at an impressionable age, like going to see your first animated film in a theatre. It scars the brain and you remember it forever, especially if you were entertained by it and everyone your age was talking about it.

"We know that there are still plenty of fans out there. We continue to receive mail from fans expressing their gratitude and inspiration to seek a career in animation. That's pretty amazing."

» The cel-shaded visuals in *Dragon's Lair 3D* clearly evoke the original game.

INSIDE THE DRAGON'S LAIR

We chat to director Martin Touhey about his upcoming Dragon's Lair documentary

Why did you decide to document *Dragon's Lair*?

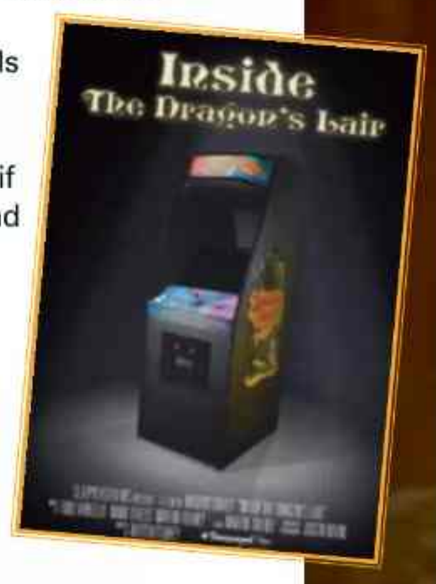
Dragon's Lair had a significant impact on my life. It's stuck with me like glue for decades. I felt that by having a subject that I was personally attached to would benefit a documentary. Not only was *Dragon's Lair* a personal favourite of mine, but it was also a very interesting subject to tackle. There are very few games out there that have had the same kind of longevity. *Dragon's Lair* was also a game that had many 'firsts'. The animation angle alone was really enough to warrant a documentary about the game.

How is the project progressing?

The project is coming along quite nicely. We've interviewed about 20 people so far including animators Don Bluth and Gary Goldman. We're still in production and will be launching a Kickstarter campaign to help with the additional production costs as well as post-production. As it stands right now the release date of the film is up in the air, but we're shooting for the first part of 2014.

The various home releases over the years have included documentaries and interviews with the creators. Why should fans check out your documentary?

I've seen the mini-docs and interviews, but what I find missing from them is a solid compelling narrative. We want to create a film that tells a story that everyone can appreciate and enjoy, not just *Dragon's Lair* fans. It's all about creating a film with a narrative and if you have all the right elements in place and they're hitting on all cylinders then you'll end up with a film that's greater than the sum of its parts. So far all I've seen out there is parts.



You can follow the documentary's progress on Twitter (@dragonslairdoc) and Facebook (facebook.com/dragonslairdoc).

» Documentary director Martin Touhey, at Don Bluth's house (photo by Justin Maine).

BOMB JACK

The fizzing bombs may never actually detonate but Bomb Jack exploded into arcades regardless and left a lingering afterglow. Martyn Carroll looks back at the much-loved coin-op and its 30-year legacy

PIXEL PERFECT

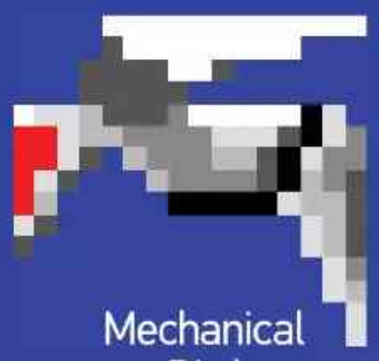
The game features some fantastic cartoony graphics*

Mummy

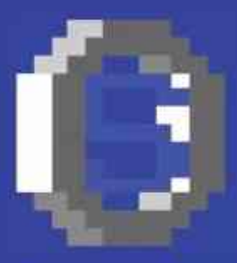
Power Ball

Multiplier

Extra Coin


Mechanical Bird

Happy Jack


Special Coin

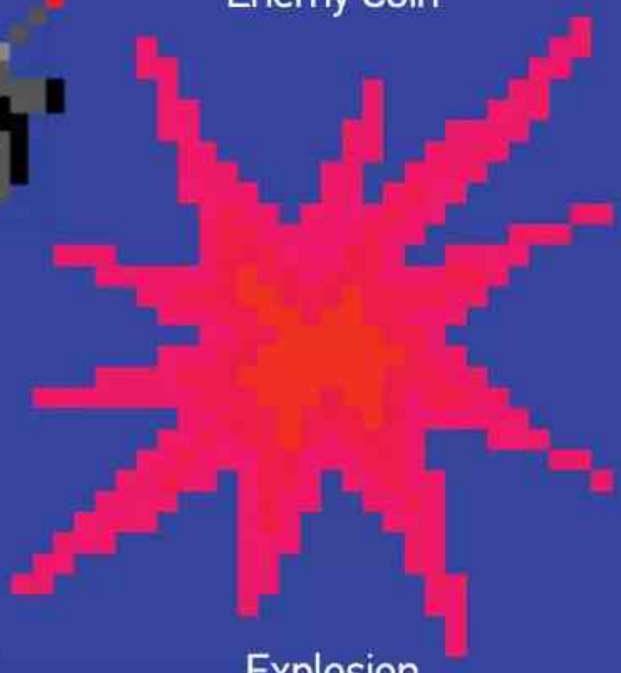
Enemy Coin

Firebomb

Powered-up Jack

Drill

Robot


Explosion

Unhappy Jack

Bomb

Bonus Coin

UFO

Orb

* Names may be made up...

Debuting in arcades in 1984, *Bomb Jack* was developed by Tehkan, the Japanese videogame company that would later change its name to the more familiar Tecmo. *Bomb Jack* was something of a departure for the firm, as most of its earlier titles were far more elaborate in execution. Its 1981 debut, *Pleiads*, was a multi-stage shooter in the style of *Phoenix*, while 1983's *Senjyo* utilised a smart 3D trick to simulate advancing alien ships. *Star Force*, released the following year, was a super-slick vertical shooter of some repute. So *Bomb Jack*, with its single-screen platforming antics, certainly wasn't pushing any boundaries.

Yet it has become a title that's instantly recognisable. At a time when new coin-ops were released at a rate of knots, and were often similar in style and appearance, *Bomb Jack* stood out in even the gloomiest arcades thanks to its colourful, cartoon sprites and brilliant backdrops. Anyone with a passing interest in gaming can easily identify the game, in particular the opening round with its iconic pyramid and sphinx background. It has become a classic videogame image.

There's also the audio. Jack zips along to various tunes (including, in a bizarre bit of music licensing, The Beatles' *Lady Madonna*), but it's the shrill sound effects that are most memorable. There are bleeps and chimes that are impossible to adequately communicate in print – no combination of ASCII characters can illustrate them. And who can forget the tense alarm sound that accompanies the occasional presence of the 'Power Ball' – a special pick-up that allows Jack to thwack enemies for a short amount of time.

The Power Ball is probably why the game is often likened to *Pac-Man*, as the two titles really have little else in common. Yes you can position yourself to lure enemies, and use platforms as barriers to block their movement, but in Bomb Jack you have much more freedom of movement and control over your character. Rapidly tapping the jump button to hover is a key skill, as is pulling down to descend more quickly or up to ascend higher.

Bomb Jack is also a high-score junkie's dream. Quickly gathering up all the bombs and moving onto the next round is fine, but to do it in style you must follow the ignition sequence and only collect bombs with sparking fuses ('firebombs'). On top of this, you need to build up the score multiplier by grabbing the bonus coins that appear on-screen. For such a 'simple' coin-op, the scoring system is really clever and one of the keys to the game's lasting appeal.

Of course, when we talk *Bomb Jack* we're not just contemplating the coin-op. ▶

▶ The game was converted to many home computers and consoles, officially in the Eighties and Nineties and more recently by homebrew teams who have ported the game to fill a gap in a system's software library. The small sprites and single-screen view made the game particularly suitable for conversion and the majority of home versions are admirably close to the arcade coin-op original.

One system that surprisingly didn't receive *Bomb Jack* was the Nintendo Famicom/NES, but that's because it got something more – or at least something different. Released in 1986, *Mighty Bomb Jack* is Tecmo's expansive, adventure-themed follow-up. There are static screens in which you simply need to collect all the bombs, just like in the original, but these are connected via scrolling sections where you plunder pick-ups from chests and explore secret rooms. Confusingly, this fun reworking was also adapted for Nintendo's arcade VS System, but its origins are on the Nintendo console.

Even more confusingly, UK-based Elite Systems, which converted the original *Bomb Jack* to home computers, released its own follow-up for the Commodore 64, Commodore 16, ZX Spectrum and Amstrad CPC in 1987. Simply titled *Bomb Jack II*, the game retained the original's single-screen approach and collect-'em-up objective, but unwisely fiddled with the gameplay. Jack could no longer fly freely around the screen; instead he could only leap from platform to platform. The initial full-price release included a copy of the original game as a bonus (or perhaps a peace offering). Elite had more success with its

» *Mighty Bomb Jack* took place in a treasure-filled, bomb-packed pyramid.

third *Bomb Jack* game, which was actually a conversion of *Mighty Bomb Jack* for the Commodore 64, Amiga, Atari ST and PC.

Following these computer and console sequels, Jack made a belated return to the arcade in 1993 – and he wasn't alone. Developed by Nippon Microcomputer Kaihatsu (NMK), *Bomb Jack Twin* was a direct update to the original game that paired Jack with a red-caped partner (Jill?). Now, two players could work together to defuse all the bombs, while at the same time competing against each other to secure the highest score after each round. In addition there were more locations (you moved around a world map, like in *Pang*) and the speed of the game was ratcheted up a notch.

Bomb Jack Twin was never converted to home systems, although Elite planned to bring it to the Game Boy Advance in 2002 as part of a compilation called *Bomb Jack World*. The pack, which was to include *Bomb Jack* and *Mighty Bomb Jack* as well, sadly never materialised. Elite's Steve Wilcox has revealed that two of the three games were complete but the company "lost focus" on *Bomb Jack World* as its mobile phone business began to take off. Indeed, Elite did release the original game for mobiles in 2003.

Versions of *Bomb Jack* for sixth-generation consoles arrived shortly after. The game was included as part of *Tecmo Hit Parade*, a PlayStation 2 collection that featured six other Tehkan-era titles. It was released exclusively in Japan in 2004. The following year *Tecmo Classic Arcade* arrived on Xbox. Happily, this improved compilation, which featured *Bomb Jack* and ten additional arcade titles, was released outside of Japan.

Second-hand copies of *Tecmo Classic Arcade* can be picked up fairly cheaply and it plays perfectly on the Xbox 360 – ideal if you're looking for a quick 'blast' of *Bomb Jack* on a more modern system.

»A glimpse of the unreleased *Mighty Bomb Jack* for the Game Boy Advance.

TEHKAN THE ARCADE BY STORM

Bomb Jack was brilliant, but let's not forget about the firm's other classic coin-ops

Star Force (1984)

Known as *Mega Force* in some regions, this vertical shooter is so good that it almost belies its age, but it really was released in 1984. It's a relentless blaster that looks as good as it plays. It was later converted to several home systems including the NES and MSX.

Tehkan World Cup (1986)

Released to capitalise on the 1986 World Cup, this fantastic football game would be enjoyed long after the competition ended. It popularised the top-down viewpoint used in later football games and featured a trackball controller.

Solomon's Key (1986)

Created by Michitaka Tsuruta, *Solomon's Key* mixes puzzle and platforming elements. It's perhaps better known outside of the arcade thanks to the many home conversions, but the original remains one of the jewels in the company's crown.

Rygar (1986)

Not to be confused with Taito's *Rastan*. While they're similar games, *Rygar* is faster-paced and more fun. Our hero romps through mythical lands, carving up beasts with his spiky weapon. A belated 3D sequel was released for PS2 and Wii years later.

Silk Worm (1988)

A side-scrolling shooter with a neat gimmick. In co-op mode (which is the only way to play really), one player pilots a chopper while the other drives a jeep, working together to destroy enemy forces. Like a lot of Tecmo games, this was a hit in the arcades and at home.

Ninja Gaiden (1988)

Tecmo's most enduring franchise, which has graced many home systems over the years, actually began life in the arcades as a scrolling beat-'em-up. Overlooked but not forgotten – the coin-op version was included as an unlockable bonus in *Ninja Gaiden Black* on Xbox.

CONSUMER SEQUELS

Bomb Jack wasn't the only coin-op with sequels developed especially for home systems

Donkey Kong II (1983)

In the arcade *Donkey Kong* was followed by *Donkey Kong Jr.* Yet Game & Watch got both a version of that game and a numbered sequel in which Junior rescued Kong by unlocking four chains. With no sign of the moustachioed one, this was a real (monkey) barrel of fun.

Hunchback II: Quasimodo's Revenge (1985)

Ocean hit the jackpot with its first arcade licence and wasted little time in cranking out a sequel for 8-bit computers. It featured new screens, varied challenges and a punishing difficulty level. Further *Hunchback* games followed from Ocean.

Target; Renegade (1988)

The Ocean boys were at it again with this home-only follow-up to Taito's street brawler. It introduced weapons, bigger areas and co-op play, and the result was easily better than most of the *Double Dragon* conversions. But don't mention *Renegade III*. Just don't go there.

Human Killing Machine (1989)

Before *Street Fighter II*, US Gold (who handled the *Street Fighter* computer conversions) pushed this as the follow-up. The same game engine was used, Ryu became Kwon and it was more of the same. US Gold also released its own *Strider* sequel in 1991.

SWIV (1991)

While not an official sequel, this shooter was clearly more than a spiritual successor to Tecmo's *Silk Worm*. *SWIV* (which stood for *Silk Worm IV*, amongst other things) retained the original's jeep and helicopter pairing but flipped the view to become a smart vertical shooter.

Frogger II: Threeedeep! (1984)

With a sub editor's nightmare of a subtitle, *Frogger* leapt from coin-ops to consoles and computers for the second game in the series. The perilous action now played out over multiple screens, and from this point on *Frogger* would enjoy a long career outside of the arcade.

Yie Ar Kung-Fu 2 (1985)

The classic fighting game never received a coin-op sequel, but the head-bashing continued unabated on the MSX. The sequel, which introduced new adversaries and, yes, flying ninja babies, was then ported to other home computers by Ocean for its Imagine label.

Space Harrier II (1989)

Forget *Planet Harriers*. The first *Space Harrier* sequel arrived on the Mega Drive as one of the console's launch titles. Sega released console sequels and updates to many of its most popular coin-ops including *OutRun*, *After Burner*, *Wonder Boy*, *Shinobi* and *Golden Axe*.

Gauntlet: The Third Encounter (1990)

Following the *Deeper Dungeons* expansion pack, this sequel to the first two *Gauntlet* arcade games was released for the Atari Lynx. In a (daft) departure from the original, new character classes included Nerd and Android! *Gauntlet III* and *IV* later appeared on home systems too.

Parasol Stars (1992)

The further, brolly-bashing adventures of Bub and Bob were developed by Taito for the PC Engine rather than arcades. Ocean then picked up the rights and converted the game to computers and consoles.

COIN-OP CONVERSIONS

How Jack fared when he made the jump to computers and consoles

ZX Spectrum

This is one of the most celebrated arcade conversions on the Speccy and it's not hard to see why. It features nicely detailed graphics, decent sound effects (the old beeper putting in a lively performance) and quick, responsive controls. It's basically as close to the coin-op as Speccy owners could genuinely expect. Perhaps the only problem is the backdrops which, while well drawn, are slightly too prominent, causing Jack and his enemies to sometimes get 'lost'. A minor issue though, and it certainly doesn't take the shine off this great game.

Atari XL/XE

Like the MSX-2 version, this homebrew release was reviewed in **Retro Gamer** (Issue 58) and awarded 90 per cent – a fair score for this impressive Atari 8-bit conversion. A quick glance at those chubby sprites reveals that this is based on the divisive Commodore 64. It's an improvement though, with extra space to manoeuvre and more responsive controls. The game requires a hefty 320Kb of RAM, so running it on real hardware may be tricky. But it's worth emulating to see how the C64 version could have turned out with some extra work.

MSX-2

Released in 2004 by the Kralizec team, this heady homebrew port was reviewed in an early issue of **Retro Gamer** (Issue 13, back issue fans) and awarded 90 per cent. The high score was definitely deserved as this is a sterling piece of work. The graphics and sound are authentic (the in-game music from the coin-op is carried over, unlike other home versions) and the gameplay is equally true to the original. If you discount the PS2/Xbox versions, which are arcade perfect, this is the best, most faithful *Bomb Jack* conversion available.

PC-8801

The NEC computer, obscure outside of Japan, was home to a surprisingly large videogame library that included a reasonable conversion of *Bomb Jack*. Graphically it has to be the most ghastly version ever released! The colours are garish beyond belief and to top it off, the platforms and borders are all rainbow-coloured. Character movement is a bit choppy and prone to flickering, but the game plays well enough. The PC-8801 featured a capable sound chip that's put to good use, rattling out some tap-along tunes.

SG-1000

The Master System never received a version of *Bomb Jack* yet the game did appear on the earlier Sega console, the SG-1000. And it's a fine attempt, courtesy of Sega itself, who obviously knew how to get the best out of the modest hardware. The character graphics are crude and the bombs look like boxed pumpkins, but the gameplay is fast, tight and admirably close to the coin-op original. Years later *Bomb Jack* was unofficially released for the MSX-1 and it was this version that was ported rather than any of the other Z80 releases.

Game Boy

Released in 1992, this version might have been late to the party but it was well worth the wait. The Game Boy was often burdened with overly-ambitious conversions, so it's pleasing to find that *Bomb Jack*'s single-screen play is a perfect fit for the Nintendo handheld. The graphics are crisp and show up well on the tiny display and the game zips along at a nice speed. The sound is great too, featuring a couple of compositions that play over the main menu and the Game Over screen. A top job all round.

Commodore 16

The C16 was often home to horrible coin-op ports, and in that dubious regard this doesn't disappoint. The graphics are messy, movement is jerky, sound is spasmodic – and that's being kind. Due to lack of memory, there are only two backdrops, and to view the second you have to load the other side of the tape! The real killer though is the difficulty level which is ridiculous. It's possible to get chomped by a bird within two seconds of starting a game. This is one platform where *Bomb Jack II* was better.

ST/Amiga

Arriving several years after Elite's 8-bit attempts, you'd expect the ST and Amiga versions to be pretty much arcade perfect. Visually they're not far off, but both suffer from sluggish and twitchy character movement. Being able to zoom smoothly around the screen is one of the coin-op's key assets but it's just not represented here and it really spoils things. There's a curious STOS/AMOS feel to the whole game. Both versions are more or less identical, which explains them being grouped together, although the sound on the Amiga sound is slightly better.

Amstrad CPC

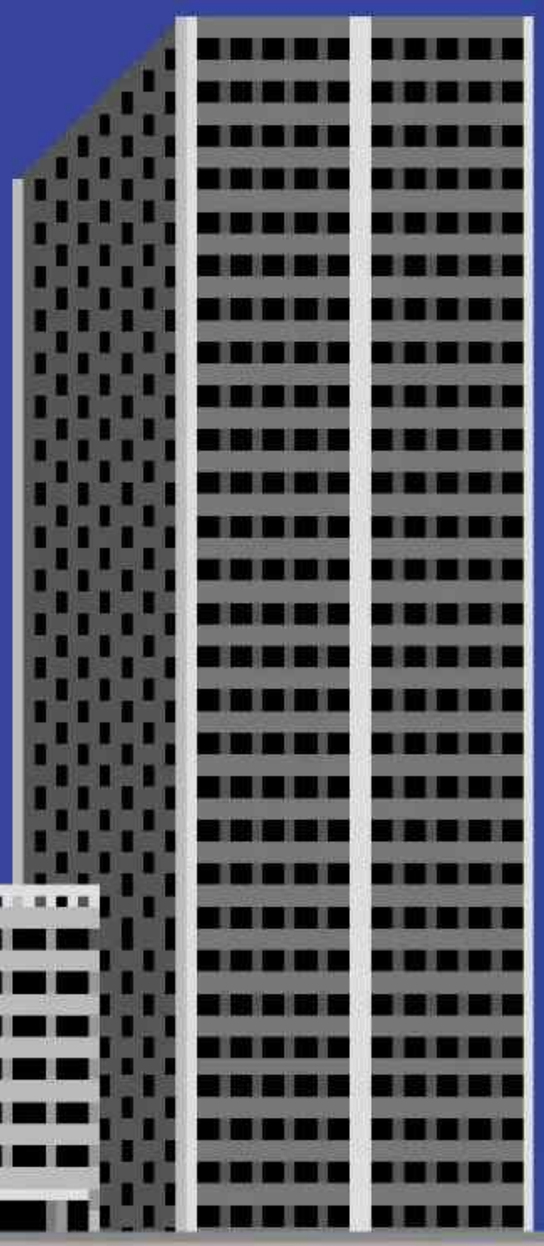
No sign of a lazy Spectrum port here, thankfully. This dedicated CPC version is genuinely delightful – there's a copious amount of colour splashed around and plenty of authentic arcade sounds accompanying play (it's just a shame there's no option for in-game music). While colourful, the characters do lack detail. Jack's face, for example, is just a white blob, so some of the fun expressions seen in other versions are missing. Overall though, this is (just about) the best of Elite's *Bomb Jack* conversions for 8-bit computers.

Commodore 64

The SID chip is given a good run-out here, with catchy tunes (care of Mark Cooksey) popping up at every opportunity. This is not to the detriment of other areas as this is a decent enough conversion featuring the fast, fluid gameplay of the original. But visually something is a little off, at least when compared to the coin-op. The sprites are too chunky so the action plays out in somewhat cramped conditions. On the upside this enhances the game's cute, cartoon feel. The C64 version is not poor or wrong, just different.

PS2/Xbox

The versions for the PlayStation 2 and Xbox are identical to each other so can be spoken about in the same breath. Both are included in Tecmo arcade compilations and are essentially arcade perfect – the emulation really is spot on. A few additional game options would have been welcome, as those that are included are just the coin-op's dip switch difficulty settings (you can alter the speed of the birds, the number of enemies and so on). Screen settings are limited to zooming in and out.



MONOCHROME MAKEOVER

How Alberto Gonzalez and Ricardo Fernandez ported Bomb Jack to the Game Boy

How did you land the *Bomb Jack* job initially?
Alberto Gonzalez: At the time our employers, New Frontier, were working very closely with the European publisher Infogrames. We did many 8-bit versions of its 16-bit games. Infogrames got the licence and entrusted the conversion to us.

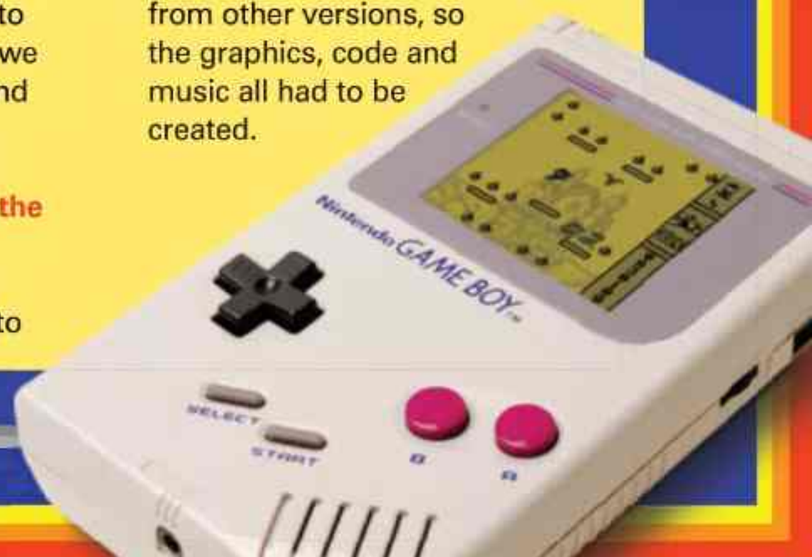
Did you have access to the arcade version during development?
AG: Yes, they sent us the arcade board but we had no place to plug it in! So in the end we used the Spectrum version as a reference. We did have some input from Tecmo to polish it, mainly relating to the control of the character like pressing down on the pad while falling to fall faster.

Tell us a little about the music.
AG: I composed and programmed all the sounds and music in the game. I didn't know much about the sound of original arcade so I composed new music, although for the in-game music I used the Atari ST version as a reference. There's a video of me on Facebook playing a prototype ROM with the very same Game Boy I used for composing the music (tinyurl.com/nle67p4).

Because the Game Boy screen was small, did you ever consider making the display scroll like Taito did with the Game Boy version of *Bubble Bobble*?
Ricardo Fernandez: No not really. For us it was very important to see all the action at once, so we immediately ruled out any kind of scroll.

How did you find coding for the Game Boy?
RF: It was not hard, it was actually pretty fun. I learned to program on the Spectrum and the assembler code is very similar between both machines so it wasn't hard to adapt. It took us approximately four months to finish the game. For a conversion of this kind you can't use too much from other versions, so the graphics, code and music all had to be created.

» Ricardo (left) coded the conversion while Alberto handled the audio.



THE UNCONVERTED

Arcade games that never made it home

MACH BREAKERS

■ **Developer:** Namco ■ **Year:** 1994 ■ **Genre:** Sports

■ **By the mid-Nineties, regular athletics games were no longer enough for gamers – or at least, that was Namco's perspective.** Eschewing the charms of real-world athletes like Daley Thompson, *Numan Athletics* was a cult hit featuring superhuman athletes. Namco was pleased enough with its performance that it quickly put a sequel into production, and *Mach Breakers* arrived the next year.

Mach Breakers offers players a choice of seven extraordinary individuals with ordinary names, like the American all-rounder Johnny and the Japanese speedster Makoto. They're pitted against each other in a variety of events, and while the opening sprint is just extraordinarily fast, things quickly turn bizarre. There's no 110-metre hurdles event here – instead your chosen superhuman needs to kick their way through thick walls of ice. Even stranger events await, from monster-hauling to missile-chucking, and even miniature shoot-'em-up sections that resemble a light version of Atari's classic *Tempest*.

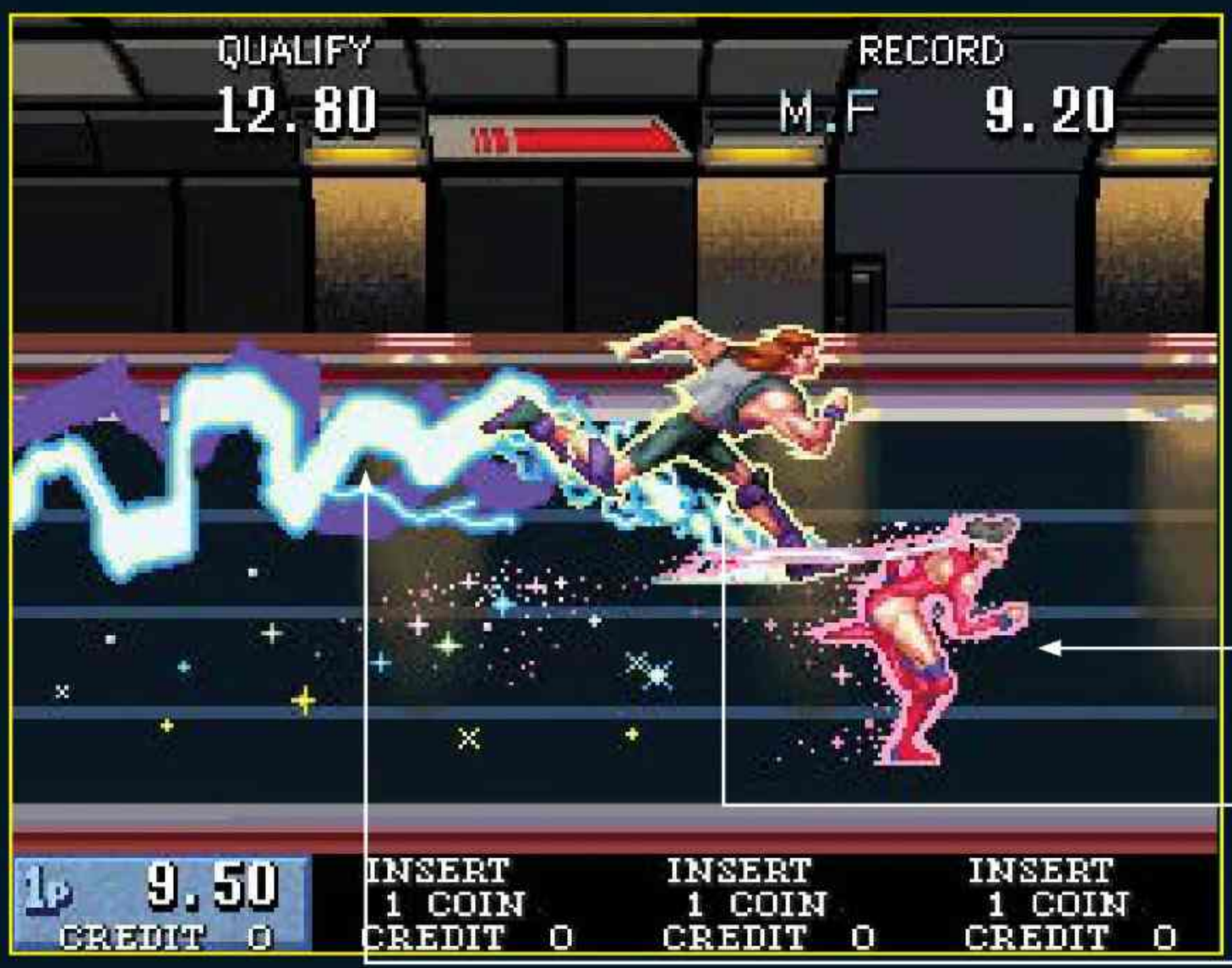
It's a rather excellent multiplayer game, with up to four players able to join in and simple controls to allow even first-timers a fair chance of success. This is aided by the game's structural improvements over the original *Numan Athletics* – events are now easier to pass and players are offered a choice of events after the initial sprint is complete. The game is visually appealing too, with the kind of gigantic sprites and scaling effects that had become commonplace in 2D games by the mid-Nineties. In fact, much of the game's appeal lies in the sense of humour conveyed by the visuals, as it conjures up some ridiculous sights. Our favourite is the Godzilla stomp that follows a failed monster-hauling session.

It's not hard to see why *Mach Breakers* didn't make it home, as it's one of those titles which clearly illustrates the differing expectations of the home and arcade markets – there's simply not enough content here to justify a home release, especially given the multitude of conversions that would have been needed in the generational transition of the mid-Nineties. It's a multiplayer classic that is at its best when swallowing coins, and we're glad that Namco recognised that.

CONVERTED ALTERNATIVE

NUMAN ATHLETICS 1993

Mach Breaker's predecessor *Numan Athletics* is similarly awesome and features events including train-pushing and building-jumping. If you're looking to pick up the home release though, you might be in for a bit of a struggle – it was released exclusively in Japan.



» Hauling a Godzilla-style monster along is one of the most impressive sites the game has to offer, but it's no pushover – precise timing is needed to succeed.

» There's no joystick usage at all in *Mach Breakers* – every action takes place across the three buttons, with those on the left and right filling in for directions.

» Characters are varied and play uniquely, with participants rated on their performance in speed and strength. Choose wisely to compensate for the events you're not so hot at!

» It's clear that the athletes in *Mach Breakers* are more than just human, with manga-style superhero flourishes accompanying many of the most impressive in-game actions.

BEST LEFT IN THE ARCADE
LORD OF GUN

■ **Developer:** IGS ■ **Year:** 1994 ■ **Genre:** Lightgun shoot-'em-up

■ ***Lord Of Gun* aims to offer variety to players, with each stage offering a different setting and new weaponry.** However, almost every aspect of the game is laughably bad. The visuals are awful, featuring unattractive sprites with some of the most atrocious animations to have appeared in a Nineties arcade game. This would be forgivable if the game played well, but there is no semblance of a difficulty curve on show. Hostages are often identical to enemies, meaning that players will be relying on shouts of "I'm a hostage" to identify them – always a solid design choice in noisy arcades.

While *Virtua Cop* arrived in the same year as *Lord Of Gun*, it's a little unfair to draw a comparison between the two – they were developed for very different markets by companies in wildly different positions. However, it's harder to forgive the fact that *Lord Of Gun* struggles in comparison with *Operation Wolf*, a game released seven years earlier. By failing to recognise the advances made in the intervening years by games like *Alien 3: The Gun* and *Steel Gunner*, IGS doomed *Lord Of Gun* to irrelevance. Thankfully, the developer left the genre alone entirely in the following years.

HOT SHOCKER

■ **Developer:** E G Felaco ■ **Year:** 1982 ■ **Genre:** Maze

» Each stage has a distinct colour scheme, including one with an invisible web.

■ ***Hot Shocker* is one of the stranger releases of the early arcade market.** The game resembles Konami's early release *Amidar*, but has moved from a grid format to an octagonal maze that resembles a spider's web. You're tasked with avoiding enemies, while visiting every part of the maze with wire in order to connect phone lines and move onto the next level. Most of them move around the web and only serve to slow you down in order for the more lethal enemies to catch up to you, but a lightbulb appearing at the fringes will zap careless players.

The main addition to the *Amidar* formula is that of a power-up, which gives your hero a temporary boost in the form of speed and invincibility. It resembles an enemy with different colouring though, so it's easy to miss. *Hot Shocker*'s failure to leave the arcade is easy enough to explain – as the only game manufactured by E G Felaco and a pretty derivative one, there was no mileage in licensing the game for home systems. And if you were a clone programmer, was there any sense in skipping the innovator to clone the imitator? No, there was not.

CONVERTED ALTERNATIVE

AMIDAR 1981

Amidar was the obvious inspiration for *Hot Shocker*, and is easily the more famous game. Konami's game was only converted to the Atari 2600 officially, but a large number of unofficial clones exist for a variety of formats including *Cuthbert Goes Walkabout*, *Traxx*, *Crazy Tracer* and *Crazy Painter*.

CONVERTED ALTERNATIVE

MIDNIGHT RUN 1995

As we mentioned, *Winding Heat*'s predecessor did manage to make it home. A PlayStation version was released in 1997, exclusively in Japan. Be warned, though – before you rush to import it, know that the conversion is no classic, thanks to some jerky visuals and sloppy handling.

WINDING HEAT

■ **Developer:** Konami ■ **Year:** 1996 ■ **Genre:** Racing

■ **Konami certainly waited a long time to follow up on *Road Fighter* – despite making its debut in 1984, a sequel didn't appear until the mid-Nineties.** Luckily for fans of that sequel, the 1995 release *Midnight Run*, a new game was much quicker to arrive as Konami released *Winding Heat* just a year later.

Winding Heat offers a surprisingly large number of cars, with 14 available – each of which also has multiple tuning options. The excess continues in the on-track action, as while only four drivers take part in each race, they've got to contend with heavy traffic as the races take place on public roads, which bring to mind the mountain passes of the *Initial D* series. Races are fun and frantic thanks to some track design that holds up well, but the handling is disconcertingly loose.

» There might only be four racers, but the battles are always intense on *Winding Heat*'s mountain passes.

With market preferences shifting towards more realistic racers like *Gran Turismo*, arcade racing games were having a hard time attracting attention in the console market. It's likely that *Winding Heat* didn't make it home for that reason – its predecessor, which did manage to reach the PlayStation in 1997, never gained much of a reputation.

PAPERBOY

When Paperboy rode in to arcades in 1984 he brought with him colourful cartoon visuals, a unique control method and fun gameplay. Darran Jones speaks to creators John Salwitz and Dave Ralston and finds out how they managed to create the ultimate busman's holiday

It's amazing what effect alcohol can have on you once it's swilling around your innards. Some people get an increased sense of confidence, while others suffer from a lack of judgement that sees them making decisions they'd otherwise normally never consider. In the case of John Salwitz (currently senior development director at Electronic Arts) and Dave Ralston (a designer for Locomotive Games) the aforementioned alcohol consumption allowed them to overcome a stumbling block on one of the most popular games of 1984: Atari's *Paperboy*.

"Back in those days Atari was famous for having Beer Fridays," laughs Dave Ralston who, along with Will Noble, was *Paperboy*'s designer and lead artist. "We had a tapper there on the premises and one particular Friday there had been a party; when John and I came in the next day there was still plenty of beer in the keg. Anyway, we dragged it outside onto this atrium and did some brainstorming."

"I think that was the magic moment when everything clicked," agrees John, *Paperboy*'s lead programmer. "Dave had these wonderful storyboards that showed a projection of the entire street and we literally populated it that very day. We probably knocked out around 60-70 percent of where all the characters in the game would finally end up."

"We were probably stupid for never doing that sooner," laughs Dave. The laughter continues throughout our 40-minute interview and it soon becomes obvious that the two friends both have a huge amount of respect for each other and the game that they brought kicking and screaming into the arcades after a 24-month gestation period. But where did the original concept first come from?

» As the week progressed, the obstacles got harder and harder to negotiate.

"There had been a game that had just come out in the arcades called *Zaxxon* which had this really cool isometric perspective and it felt really fresh," recalls Dave. "We saw it and realised that the isometric perspective would offer a very good view of the action in our game and that it would work far better than a side scroller or a top-down. As for the game itself it grew out of the fact that there were five boys in my family and I was the last one and we were all paperboys, so I just took it from there. I think I was a really good paperboy. In fact, I seem to remember that I was a great paperboy," he continues. "The one thing I can remember about those days is driving around as a family and seeing newspapers on roofs and in bushes and stuff. Not everyone was a good paperboy in real life and I think that was at the heart of the idea. I just thought it would be an interesting twist for a game."

Interesting *Paperboy* most certainly was. Most games of the time saw you shooting down wave upon wave of vicious aliens, negotiating mazes or jumping across simplistic platforms; they certainly didn't allow you to participate in your part-time job.

Set over seven days, your task was to deliver papers to subscribers, while causing as much damage as possible to the homes of non-subscribers. Papers could be replenished en route and once you'd completed your daily round you could take part in a short but exhilarating obstacle course. It may have sounded simplistic, but with each street being littered with obstacles it took real skill to negotiate them, especially if you tackled 'Hard Way', *Paperboy*'s final street.

Paperboy may have been exciting and fresh back in the early Eighties, but those beautiful visuals, state-of-the-art controller and slick gameplay did come at a price: the aforementioned 24-month time period…

"It took two years mainly due to some of the changes we had to make along the way," explains Dave. "It was pretty much

» While you scored points for breaking the windows of non-subscribers, care had to be taken not to hit any others.

JUST A BIT OF HARMLESS FUN

Don Traeger may have been instrumental to *Paperboy*'s final success, but that didn't mean that Dave and the rest of the team liked to make things easy for him (all in the name of a good joke, you understand). "I remember that we made this bogus earnings report for him," recalls Dave, which instantly jogs John's memory and sends him into guffaws of merriment.

"It was our first field test when you'd put the game out in an arcade, and I think Don must have gone on vacation right after it happened. Anyway, he went away for a whole week and while he was absent we got somebody in marketing (probably Jackie Sherman) to type up an earnings report so that it looked like all the others, except of course, the earnings were horrible. It just showed that the game had absolutely tanked and then I just wrote across the front of it 'Project Cancelled'. We just left it on Don's desk and waited for him to come back from vacation. It was far from the truth as it actually tested very well."

IN THE KNOW

- **PUBLISHER:** ATARI
- **DEVELOPERS:** JOHN SALWITZ, DAVE RALSTON
- **RELEASED:** 1984
- **PLATFORMS:** ARCADE, VARIOUS
- **GENRE:** ACTION

everything really, from changes in the schematic style, to alterations to the actual controller. It certainly took us a while to figure all those things out."

Fortunately, it wasn't all bad news, as one of the main differences – and for the two men, the most satisfying – was the change in hardware, which gave John, in particular, far more freedom than when the project had first started. "Originally *Paperboy* started off life as a low-resolution game (about 320 x 240 pixels) before Doug Snyder created the new medium-resolution System II board for it," begins John. Which explains why it looks very different to earlier games of the same period. "The hardware changed substantially and schematically, it basically went through a radical shift."

As well as having to deal with the change in hardware, the cost of the machines meant that the game had to be created as efficiently as possible, which in turn added to *Paperboy*'s development time. "That game is literally made up of little 8x8 blocks," continues John. "The backgrounds were painstakingly created one by one; it's a lot like building with bricks, except the bricks have already been painted. The animations and characters were built using some pretty primitive tools, and so due to the cost of putting all that together, we couldn't really do a lot of extra things and we were very deliberate when putting it all together."

Paperboy's conception may have been long and arduous, but one thing that did make a difference was the sheer amount of playtesting that the game went through. Over the course of its two-year development time, *Paperboy* went through numerous focus groups

» Due to its arcade success, *Paperboy* appeared on a variety of home formats, so we've gathered a small selection here. (Above) C64, (Below left to right) Amiga, Atari Lynx, Master System, Spectrum, Game Boy.

"WE DID HAVE A JOYSTICK ORIGINALLY, BUT WHEN WE FOCUSED THE GAME WITH [IT] IN PLACE, IT JUST DIDN'T GO DOWN WELL AT ALL... WE WANTED TO TRY SOMETHING A LITTLE MORE UNIQUE" DAVE RALSTON

» The original arcade flyer. Note the machine shot showing those famous handlebars.

and playtests before it was eventually released to a more than satisfied public.

When Atari had a new game in development it would simply take a prototype down to a local arcade, leave it in there for the day and judge its success on the amount of quarters that rolled in. It was a concept that wasn't lost on John and it also allowed one of the other key players in *Paperboy* to come to the foreground: marketing rep Don Traeger.

"Atari's playtesting process was the most beautiful test there was; it really doesn't get any better," gushes John. "We did a lot of focus group testing as well and that was where Don Traeger really started to get involved. In fact, Don is a very big part of the reason why *Paperboy* ever got finished, because he was not only the original marketing partner on it, but he also came in at a point in the game where we were really struggling.

"We'd just had this really horrific focus group, and it was just heartbreaking and frustrating for the team because we really cared about the product we had created. So anyway, he came in, ran that focus group, came out and everyone – I mean everyone – was saying horrible things about the game. Afterwards he comes out with this really big smile and says, 'That was great, we learned a lot from that.' After that he proceeded to help us really understand what was going on."

Traeger played another important role in *Paperboy*: that of the actual Paperboy himself. Asking about the origins of *Paperboy*'s speech brought many a laugh from John until he admitted that the main character's voice belonged to none other than Traeger, who's now CEO of Locomotive Games. But how does being the voice of a videogame character stack up to being a CEO? "To this day he takes a lot of pride in the fact that he was the voice of the Paperboy and people still remember him for that," laughs John. "It was no actor we used; it was just the marketing guy."

While Traeger started taking control of *Paperboy*'s focus groups, Dave and John quickly found out that one of the easiest ways of getting feedback for the game was to simply carry on working on it. "One of the other key ways that you did testing at Atari was that if anyone was going to walk over to your lab or cubicle you would just let them play the game, which is amazingly dissimilar to the way things happen these days," says John. "There was just so much casual play from other people in the building that I think it was one of the best ways that you could ever understand what really did and didn't work. You could tell when your game was good because people were coming over at lunch and plenty of other times and were literally interrupting your work just so they could have one more go. We'd just sit there and watch them play."

While plenty of playtesting ensured that *Paperboy* was a hit with its target audience once it was eventually released, there were still plenty of other problems that the team needed to solve. While the most recognisable aspect of the arcade machine is the shining chrome handlebars that adorn the front of it, they weren't in place at the beginning of *Paperboy*'s conception.

"We did have a joystick originally," begins Dave, "but when we focused the game with the joystick in place, it just didn't go down well at all.

"I think the joystick was confusing at the time because of the perspective that we were using," he continues. "We had always had something at the back of our minds that we wanted to try something a little more unique and the joystick feedback that we received kind of confirmed that." Leaving the joystick idea behind, John and Dave left the unique control mechanism – "it was basically a *Star Wars* flight controller that was just modified for *Paperboy*" – in the more than capable hands of Milt Loper.

"Atari at that time had a very active mechanical shop," begins John, when we ask him about the creation of those iconic handlebars. "It was amazing; those guys could pretty much build anything and it was part of Dave's philosophy that we should always try and innovate in all things. In the end we decided that the controls were just another area that we had a chance to innovate in. You also have to keep in mind that back in the early Eighties, we didn't know for sure

» Get hit by a car and you certainly knew about it.

DEVELOPER HIGHLIGHTS

720°
SYSTEM: ARCADE
YEAR: 1986

KLAX
SYSTEM: ARCADE
YEAR: 1989

RAMPART (PICTURED)
SYSTEM: ARCADE
YEAR: 1990

CONVERSION CAPERS

With the arcade game proving to be so popular, *Paperboy* quickly started appearing on various home consoles and computers. Indeed, it was recently released on the 360's Xbox Live Arcade, but neither Dave nor John have had a chance to play it yet.

"I remember the NES version, for me at least, being a huge surprise," recalls John. "Right after we did *Paperboy*, we dove into *720°* and right after that it was *Cyberball* and right after that it was *Rampart* – we were just so focused on our own work. We never thought about how we could continue marketing a product, we were all about what can we do next, and it always had to be completely different. If I'm truthful we were coin-op purists and for us, coin-op hardware was so much more powerful than anything that was in the home. So I think the real truth is that we probably looked down our noses at anything that wasn't coin-op at the time, purely because of the difference in hardware and what you could do with it. At the time I don't think we understood the potential of home sales – this was Atari after all – and we had just got through the VCS nightmares and so we didn't really have an appreciation of what Nintendo was doing at the time at all until it really took off."

that even the joystick would become a foundation for control, or the trackball for that matter. We just saw them as kind of stepping stones to other controls. In the end it turned out that the handlebars themselves made for the most natural way of playing *Paperboy*. We never tried to create them as a way of simply increasing sales; it has always been about what was best for the actual game."

With *Paperboy*'s controls system now decided, one other factor had to be taken into consideration: namely, would the chrome handlebars be strong enough to withstand the vigorous assault of the average arcade-goer?

"There was a guy at Atari called Dave Stubben," begins Dave, which immediately causes John to burst into fits of laughter. "He was one of the senior execs at Atari games, and he was a very big, very strong guy. And in all the controls that we used there was always this thing called the 'Stubben rule'. Basically, if the controller could survive Dave then it was going to be okay. So obviously with this controller, this piece of chrome steel that was bolted onto the front of the machine had to be really resistant to leverage and anything else you could think of."

While the final handlebars eventually passed the test with flying colours, John recalls an earlier prototype that didn't fare quite so well…

"The funniest story I remember is that Mark Cerny came into the lab one day and we had just gotten this brand-new controller in that we were very excited about it. So anyway, I looked at Mark and told him, 'You just watch, it's going to survive and everything.' He basically looked me straight in the eye and said, 'No it won't.' He then decided to give the thing a massive twist to see if he was right and it practically came off in his hands. It didn't survive him at all and Mark's not a big guy, so that particular incarnation never even got close to the rule."

Eventually the handlebars were in place, and they helped to give *Paperboy* a thoroughly different experience to all the other games that were around at the time. Once you gripped those handlebars in both hands, you were

ready to set off on your delivery route through suburban America. With its brightly coloured houses, traditional mail boxes and copious amounts of speech, you could almost imagine that you were actually riding down a sidewalk and delivering papers. To further add to the realism, John and Dave ensured that the majority of obstacles you encountered also added to the authenticity. Therefore, dangerous dogs would chase you up the street, huge cars and motorcycles would zip across each road's junctions, and there were even remote controlled cars and self-aware lawn mowers to avoid. While the hazards would get stranger the further you progressed, they were nothing like the obstacles that John and Dave had originally intended to use…

"Initially, we wanted *Paperboy* to have a surreal feel to it," explains John, about the game's distinctive look. "We went crazy for a while and the focus groups that saw it just didn't get it," says Dave. "We had things like speedboats going down the middle of the street, giant snails at the various junctions and even ducks in business suits that would walk up and down the sidewalk. Just really bizarre stuff like that," he chuckles. "The actual perspective was the same, the look of the art style was the same, and it was just all these wacky characters that weren't received very well.

"For some reason when people rode down the street they just didn't expect to see them," continues John. "Which is strange," interjects Dave who, like John, is once again fighting back laughter. "I see these things all the time."

Dave may well be used to seeing the grim reaper and unicycle-riding punks whenever he goes for a Sunday drive, but one thing that is noticeably absent from *Paperboy* is the ability to play as an actual girl. As John explains, the absence of a female delivery girl was down to memory restrictions and not for any other reason.

"Physically, our ability to put more than one character into that hardware would have been very expensive at the time," he tells us. "The system constraints just stopped you from doing a lot of things and you were literally counting every byte you were putting into things. The central character of the game used an enormous amount of memory, particularly graphics memory (EEPROM) so the storage of that would have been very prohibitive. So we were really stuck with a single character no matter what we did. As for the choice between whether it should have been a paperboy or a papergirl, you just kind of go with the thing that's the most obvious, except of course for the giant snails and all those other things… I'm sure we talked about it at the time, but there would have been no practical way for us to get more than one character in the original game."

With the thought of what didn't make it into the game still fresh in their minds, we are keen to ask the pair what other aspects of *Paperboy* ended up on the cutting room floor.

"Well, I remember just how much trouble we went to in trying to give the Paperboy a throwing animation," muses Dave as he ponders the question. "In the end though it was proving to be such a nightmare we just decided that he shoots them out of his head." Other missing features included proper physics and motion that would see newspapers bounce off walls or get caught in hedges; a larger obstacle course, which at one stage was even going to be the basis for a sequel; and the ability to ride down the other side of the street. "I particularly liked this one," admits Dave, "and we talked about how we would implement it for ages. We initially talked about going down the other side of the street and having it go in the reverse direction and bringing more traffic into play, but then we would have had the safety commission coming down on us even more."

Despite numerous playtests, stressful focus groups and snapped handlebars at various points in its creation, *Paperboy* was a huge success for Atari and remains a beloved classic to many gamers today. With the benefit of 30 years of hindsight we are eager to know what changes John and Dave would have made to the game if they'd had the time and opportunity.

"One thing we did think about at the time was to ship *Paperboy* as a serialised game," reveals John. "At the time everything in arcades was based on how much replay you would get out of it, so we did once consider shipping out just Easy Street and then releasing the other two roads three to six months later. I think if we'd gone with this serialised release we would have sold more units."

"Man, that's greed, pure greed," laughs Dave. "If I was to return to *Paperboy* today the only element I can think of expanding would be the whole BMX biking side of the game and maybe working a trick-based scoring system into it. You could have style points for throwing papers while in a jump, or doing a flip or whatever. I think that would have worked really well…"

While Dave muses about his super-athletic Paperboy that was never to be, we were keen to ask John why he thinks their creation remains so enjoyable to so many of today's gamers. "We had a wonderful team," he concludes after a brief pause, "and the people involved are still my very dear friends. We had a really good time working together, and to be able to work with four or five people and have each of them focused on a completely different part of the game and still be able to talk about it afterwards is a really rare and wonderful experience. I feel *Paperboy* was successful because the team was successful."

» At the beginning of each day you'd be immediately told how many subscribers you had left.

» As a reward after finishing your paper round, you got to ride along an obstacle course.

"OUR ABILITY TO PUT MORE THAN ONE CHARACTER INTO THAT HARDWARE WOULD HAVE BEEN VERY EXPENSIVE AT THE TIME... YOU WERE LITERALLY COUNTING EVERY BYTE" JOHN SALWITZ

» Mindscape's sequel was so bad, this is the only mention we're going to give it. The N64 version wasn't much better.

» Successfully finishing the obstacle course saw you being treated with a pleasant congratulations screen.

STILL GOING

Amazingly, Atari's *Paperboy* is still wowing gamers, and it's on Microsoft's 360 of all things. Converted by Digital Eclipse, the Xbox Live version of *Paperboy* features online leader boards, a variety of achievements (some of which are incredibly hard to earn) and an assortment of online two-player games.

Sadly, while the game is as enjoyable as ever – although if we're brutally honest, the 360's D-pad isn't a match for the arcade machine's handlebars – taking the title online wasn't perhaps the smartest move that Digital Eclipse has ever made, mainly because it's just so damned laggy.

Still, it's certainly not bad for 400 points (around £3.50) and while an updated look would have been nice it certainly beats being a paperboy for real.

Asteroids

SHOOT, SHOOT AND SHOOT AGAIN

» RETROREVIVAL

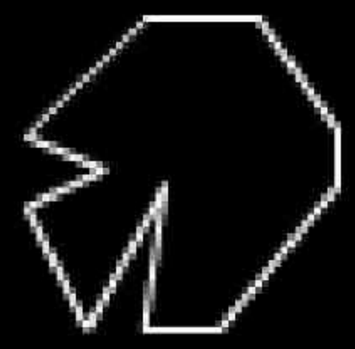
» ATARI, INC
» ARCADE
» 1979

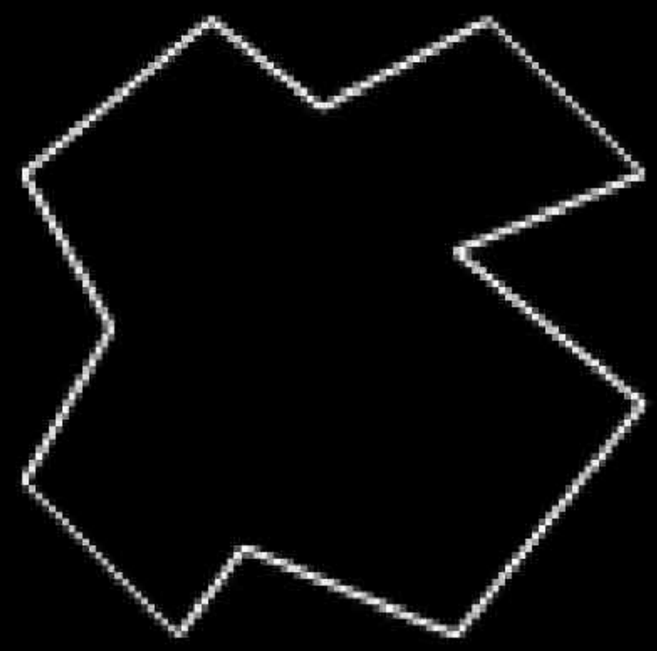
Ed Logg is a genius. When he worked at Atari he was involved in a large number of hit games for the company, from *Super Breakout* to *Gauntlet* and *Centipede*. One of his most memorable achievements, however, is this incredible shooter from 1979, which he designed alongside Lyle Rains and Dominic Walsh.

As with many arcade games of the golden period, the concept of *Asteroids* is simple: shoot down as many asteroids as possible. Of course, while the idea is simplistic, the gameplay is anything but. Asteroids appear on screen and you shoot them down. As they are shot, they break into smaller pieces, meaning there's a higher chance of colliding with smaller debris.

Your ship is far from defenceless, equipped with a thruster, but this must be managed carefully as it takes a while to slow down, meaning it's all too easy to fly into an errant asteroid. As more pieces fill the screen, the game gets incredibly tense as you try to find a safe place. You can send your ship into hyperspace, which may get you out of the way of an incoming rock, but the more you use it, the more time you'll have added somewhere you don't want it.

Add a couple of highly accurate flying saucers that appear at certain stages to hurry you along, and *Asteroids* is a game like no other. Every game plays out differently, meaning it is always fresh and exciting. Although it received several ports and sequels in the years that followed, nothing is as good as the original. A true arcade classic.





RIDGE RACER

22 YEARS ON, RIDGE RACER IS STILL BURSTING OUT OF CORNERS AT DAFT SPEEDS – BUT HOW DID IT BEGIN? JONTI DAVIES CHATS WITH FUMIHIRO TANAKA, GAME DESIGNER ON THE ORIGINAL COIN-OP, AND YOZO SAKAGAMI, WHO WORKED ON THE PLAYSTATION VERSION OF THIS SEMINAL RACER

Several significant hardware and software shifts mark the early Nineties as a crucial and defining period in the history of videogames, and few games embody what those years were about more succinctly than Namco's *Ridge Racer* coin-op and its subsequent PlayStation conversion. The arcade version was one of Namco's pioneering polygonal excursions, a texture-mapped marvel of the time; not exactly a tech demo, but certainly an experiment. Meanwhile the PlayStation version, which debuted alongside Sony's first console in December 1994, admirably faced up to the challenges of presenting such memory-intensive content on CD-ROM.

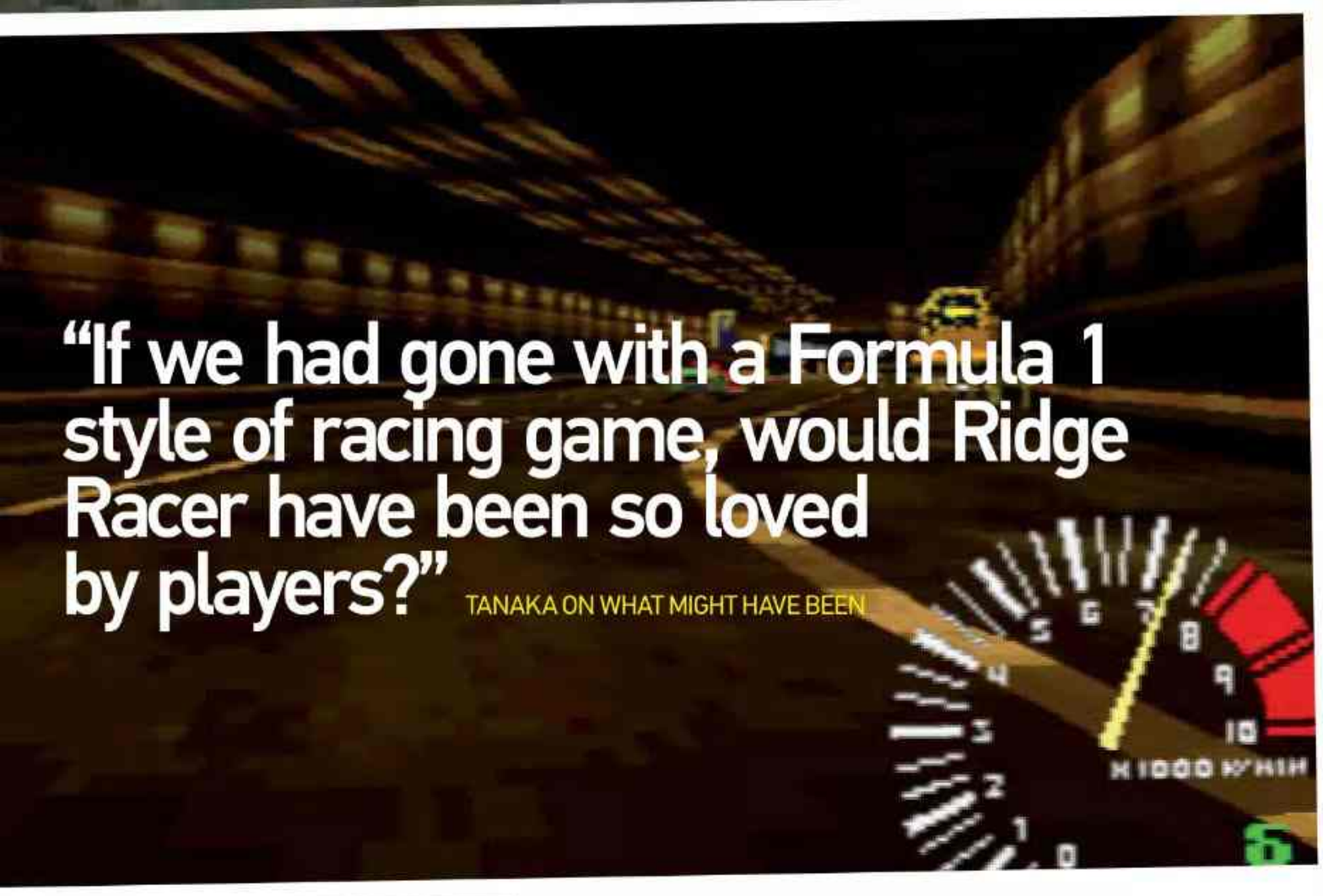
As the eloquently spoken Fumihiro Tanaka recalls, *Ridge Racer* came about because of hardware advances rather than through any purely conceptual whim: "First of all, it's important to state that *Ridge Racer* was developed to make use of some newly completed polygon-capable PCB technology, albeit in the form of a proper game. I think it's fair to say *Ridge Racer*'s concept was an idea born from polygon PCB technology."

Tanaka makes this distinction, but also points out that what ended up as the instantly recognisable sports car fiction of *Ridge Racer* could have been quite different, had the *Ridge* team been swayed by the trends of 1992. "At that time in Japan, the thinking was, 'If you're going to make a car racing game, take F1 as a theme', so at first we considered making *Ridge Racer* with F1-style cars." (One look at Sega's *F1 Super Lap* or Namco's own *Final Lap R*, both of the same vintages as *Ridge Racer*, validates Tanaka's claim.) "But the result of that consideration," Tanaka continues, "was a number of different concepts which informed the final version of *Ridge Racer*: the game had to be 'on public roads', 'with machines like passenger vehicles', and it had to 'encourage players to use drift techniques'." Tanaka is confident his team made the right choice when forming that design brief. "If we had gone with a Formula 1 style of racing game, would *Ridge Racer* have been so loved by players?"

There is an argument for saying *Ridge Racer* constituted little more than a tech demo, but that notion falls apart as soon as the race begins – if anything, the "drift techniques" Tanaka mentions, which encompass the arts of powersliding and handbrake turns, outrun the impression left by *Ridge Racer*'s boundary-breaking graphics. The original *Ridge Racer* game is still a joy to play, as are most of its numerous sequels. *Ridge Racer* was, however, a

IN THE KNOW

- **PUBLISHER:** NAMCO
- **DEVELOPER:** IN-HOUSE
- **RELEASED:** 1993
- **PLATFORMS:** ARCADE, PLAYSTATION
- **GENRE:** RACER


"If we had gone with a Formula 1 style of racing game, would Ridge Racer have been so loved by players?"
TANAKA ON WHAT MIGHT HAVE BEEN

» *Ridge Racer*'s driver AI was nothing to marvel at, but the multiplayer game introduced in *Ridge Racer 2* soon provided a greater driving challenge through human competition.

"We were racing against one of our rivals who also had a 'polygonal racer' in development"

TANAKA ON THE RIVALRY THAT FUELLED RIDGE RACER'S DEVELOPMENT

little different from the other games on Tanaka's CV, with technology driving development – not the other way around. "*Ridge Racer* was developed using the very latest technology we had," Tanaka explains, "so while the project was being put together by game programmers, at the same time we were also pursuing polygon technology and searching for new display methods that hadn't previously been available to us."

This focus on technology wasn't inspired by the urge to create a fully realistic driving simulator, though. "As people who know the game will appreciate, *Ridge Racer* is not a realistic 'driving simulator'," Tanaka says in a nod to *Gran Turismo*. "Of course *Ridge Racer* had a high level of programming technology and graphics techniques, but more than that, I think it was a game with a strong sense of good taste. Players back in the day were able to race through the game and enjoy a fun feeling, because it was a first-class racing game. It wasn't advanced simulation programming that made that possible, though – I think it was down to the advanced sense of game design."

Still, while the *Ridge Racer* team was not obsessed with reality to the same extent that Polyphony Digital would be later in the decade, the emergent arcade technology behind *Ridge Racer* did force Tanaka's team into some inter-developer competition. "At that time," Tanaka reminisces, "we were racing against one of our rival companies who also had a 'polygonal racing game' in development, so we were doing our best to make sure that our game was finished first – even if by just one day – and was more entertaining."

Tanaka refuses to be drawn on which company and game Namco and *Ridge Racer* were in direct competition with, but Sega and *Daytona USA* (Sega's earliest example of texture-mapped polygonal racing) is a safe bet. Regardless, Tanaka understands the irony of the situation: "I think the other company was probably in the same position, racing against us." Tanaka again turns slightly coy when we ask him about the size of the original *Ridge Racer* team. "I can't answer this in detail, but the number of team members was much smaller than what most people would imagine." The spirit of inter-developer competition, at least, lives on…

Ridge Racer's arrival on the then-thriving arcade scene roughly coincided with the boom era of rave music and happy hardcore, and *Ridge Racer* was an inadvertent champion of these ecstatic beat-driven music forms. However, Tanaka reveals that it wasn't meant to be like this: "Can you believe that initially we were planning to have no music in the game?" It's a rhetorical question, but no – no (no n-no no), we can't.

Surprisingly, the decision to mine the brightest layers of techno was taken quite lightly, with a perceived lack of time (exacerbated by paranoia of being beaten to the grid by Sega) responsible for *Ridge Racer*'s eventual sound. "*Ridge Racer*'s music was produced at the same time as the game itself," Tanaka explains. "We didn't have time in our schedule for a surplus of tracks to be composed, so that we could pick our favourites at the end of development – that just wasn't possible. We were lucky to happen upon danceable techno music for the BGM, which really helped with the process of creating this atmosphere where players could race through the game and enjoy a fun feeling."

Adding to this "fun feeling" were the *Ridge Racer* coin-op's elaborately constructed cabinets. (See 'Racing Machines' boxout.) In the *Ridge Racer* team's estimation the value of simulation was a distant second to pure fun, but Tanaka is proud of how well the arcade cabinets supported the System 22 ROMs they ran. "The theme of the game was to put you in control of a high-power sports car, enabling you to hold the steering wheel to drive through curves and bends while skidding from side to side. Therefore, it was necessary that the steering wheel conveyed the response of the tyres in a way that players could

THE CAR IS THE STAR

One of the most interesting additions to the arcade code was the super-quick 'Devil' car, which paved the way for the outlandish designs of many later *Ridge Racer* vehicles. Sakagami explains how his team arrived at this design: "We were asking, 'How will real cars look in five years' time? Five years from now, what kind of cars will be running along the roads?' We considered the near future of sporty cars, and made some guesses about their design. With the Devil car, which was exclusive to the PlayStation version, we thought about what the strongest rival car should look like and settled on this black type of car that no one had ever driven before. At that time, the Devil car was so difficult to outrun that it was being called 'The Cockroach', but we didn't design it with a cockroach as inspiration…"

actually feel. We had H-type gears, a clutch pedal, a large seat, and so on, all prepared so that the feeling of driving a real sports car could be conveyed properly."

Tanaka and team didn't concern themselves with how Ridge Racer might be received in different territories. This was a more innocent/naïve age, when a Japanese developer could simply set out to make a game that would be fun for players in general – not a 'product' that would attract 'consumers' in specific 'markets' so as to keep the moneymen happy. "In those days," Tanaka sighs, "we didn't really think in terms of 'intended for Japan' or 'geared towards the West'. We were developing Ridge Racer to make players experience a happy feeling, and that sense of happiness from playing games we felt was enjoyed by everyone in the global community of players."

The development of Ridge Racer wasn't entirely trouble-free, but Tanaka is happy with how Ridge Racer ended up, and he is rightly proud of the series spawned by that original 1993 coin-op. Our chat ends with Tanaka relating a brief anecdote that sums up the basic highs and lows of making a new coin-op in the early Nineties: "I still remember one incident on the morning of the first AOU Show at which we showed Ridge Racer to customers. We'd spent all night preparing the prototype ROM that would go inside the cabinet, but when we inserted it and just as we powered up the machine on that morning, the screen went white and the ROM just stopped dead. I think my heart also stopped beating at that point! Eventually we found that it wasn't a programming error to blame – it was a defective ROM, so we exchanged the ROM and managed to get by without any more problems after that, which was such a relief…"

With *Ridge Racer* quickly established as a mighty name in the world of high-tech racing arcades, it was inevitable that a home console conversion would be requested for one of the CD-ROM machines scheduled to debut in Japan in late 1994.

Yozo Sakagami introduces himself with a recollection of the how, when, who and what of *Ridge Racer*'s console debut:

"Our work on the PlayStation version of *Ridge Racer* began in April 1994. Looking back at the record we kept of events at that time, it's clear that a decision on the final team members was made on 30 March 1994. There were eventually three programmers on the team, five visual staff, and one audio technician. I worked with the team as visual director. Sony had set the launch of the PlayStation hardware for 3 December 1994, so we essentially only had six months development time if we were to meet that deadline and deliver *Ridge Racer* as a PlayStation launch game."

That deadline was met – development lasted only six months – but the Namco employees responsible for this port were faced with even more challenges than Fumihiro Tanaka had encountered during his team's pursuit of the quintessential Nineties racing coin-op. The PlayStation hardware was powerful for its time, and the storage capacity of the newfangled CD-ROM format was sufficient, but data access times, purely digital controller input (the PlayStation's Analogue Controller didn't appear until 1997) and a video RAM shortfall presented significant obstacles to the kind of success Sakagami and team were intent on achieving. Part of the 'problem', Sakagami says, was how high the bar had been set by Fumihiro Tanaka's team: "Constantly during our work on the PlayStation version, we were worrying about how faithfully we would be able to reproduce the arcade version."

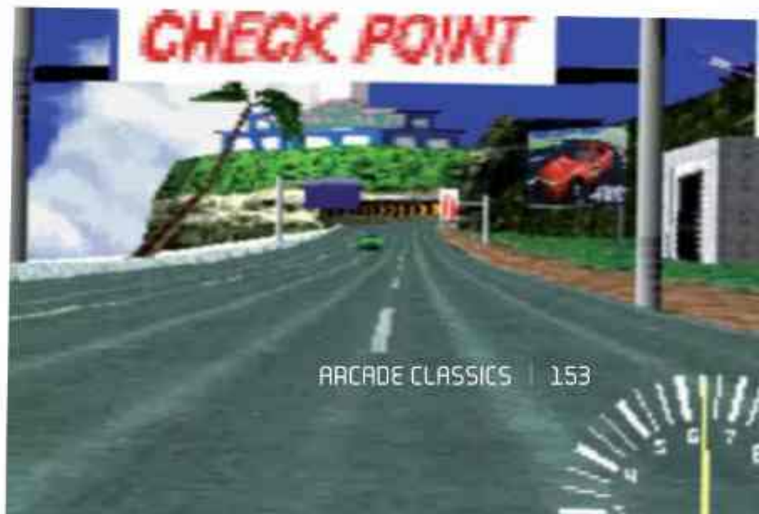
The first struggle was simply to replicate the feel of the coin-op. This was a challenge because of the restrictions of the original PlayStation controller's D-pad. "I remember at first we were thinking about how entertaining we could make the PlayStation edition with input only from a controller," Sakagami recalls, "and without the steering wheel and accelerator pedal of the coin-op. As programmers and artists, we were concerned with how we could convey the flavour of the arcade version's drift control, and we ended up making

RACING MACHINES

Namco manufactured four different styles of coin-op cabinet for the original *Ridge Racer* in Japan. The SD (standard) cabinet was equipped with a steering wheel, accelerator and brake pedals, and an up-down gearshift lever. The DX (deluxe) cabinet added a clutch pedal and six-speed gearbox, while also incorporating a steering wheel that was larger than that of the SD cabinet. On the DX cabinet, it was possible to change the position of the seat. There was also a three-screen version of the DX cabinet.

The fourth and most expensive *Ridge Racer* cabinet was the Full Scale option, which was built around a replica Eunos Roadster, complete with workable ignition and dashboard. The size and cost of this machine made it the least common *Ridge Racer* cabinet in Japan, although it could be found at half a dozen UK locations in 1993. The later Rave Racer cabinet was based on the Full Scale *Ridge Racer* machine, only replacing the Eunos Roadster shell with that of a Honda CR-X.

The first two-player *Ridge Racer* cabinet was the Twin model used for 1994's pseudo-sequel *Ridge Racer 2*, but this was simply constructed from two connected SD *Ridge Racer* cabinets. The Twin cabinet's high player turnover quickly established this as the most popular early *Ridge Racer* machine in the department stores and large arcades of Japan.



repeated mistakes. But it was actually out of this struggle that the neGcon was created…"

While the PlayStation controller's D-pad did a decent job of tapping into the arcade's 'drift' racing style, Namco's self-produced neGcon controller (which was released in Japan on 1 January 1995, just three weeks after the launch of the PlayStation and *Ridge Racer*) provided an even more faithful version of the coin-op's unique 'feel'. The neGcon (pronounced ne-ji-con, based on nejiru, the Japanese verb for 'twist') could be twisted to steer *Ridge Racer*'s powersliding cars, with the left and right halves of the pad joined by a swivel connection, and it also featured analogue buttons to facilitate gradual acceleration and braking.

From the perspective of the nine-man PlayStation *Ridge* team, the next major development challenge was posed by the CD-ROM format itself. "I have many memories of the development period," Sakagami says, "but the episode that still impresses me most when I think about it is to do with our investigation of loading times, and specifically how to work around them. Today loading times are normal, but at the time machines such as the Super Famicom were still using ROM cartridges, so there hadn't been any need to worry about loading times. So obviously once we started work on this CD-ROM game, we were really concerned by the prospect of loading times…"

Sakagami's anxiety over data access speeds might seem preposterous today, when players are still forced to sit through regular (and sometimes obstructive) loading times in their 'next-gen' games and when many games for Sony's third-generation PlayStation demand, or at least suggest, that players also install huge chunks of data to the hard disk in another time-consuming procedure. But back in the summer of 1994, with cartridge-based consoles still the standard, Sakagami was arguably right to be worried. "I felt as though any waiting times would leave a really bad impression," he admits, "especially considering that the PlayStation was this new high-spec piece of hardware. And our main programmer had the same opinion."

The stance taken by the *Ridge Racer* team was an innovative one, designed not to cut corners but to make the scenery of those corners more interesting to passers-by. Sakagami explains: "Loading is one of the limitations of CD-ROM technology that it's impossible to cancel out. So we considered ways of ensuring that the player wouldn't be bothered by the waiting times; we tried to make sure that players would be happier with loading screens than without them. We noticed that the tempo of the game was at its worst in the intervals where players would quit a game to restart, or where they had to wait for the rankings to be displayed. So we decided to make it so that nearly all of the game data would be retrieved at the first Namco logo screen after the game boots up. And we also decided to make it possible to play *Galaxian* at that point. We were thinking 'Somehow we've got to make this waiting time more enjoyable!'"

The inclusion of a playable version of *Galaxian* at *Ridge Racer*'s loading screens was more than just a gimmick, though – it was also one of the earliest shows of a developer referencing its own company's retro game heritage within an advanced 3D game, signalling the potential gulf between polygon-pushing software on CD-ROM and everything that had gone before. A lo-res rendition of the game in auto-play was also displayed on the gigantic virtual LCD panel above the entrance to the first tunnel on *Ridge Racer*'s now iconic first racing circuit, in another show of the future embracing the past.

We ask why, of all Namco's classics, *Galaxian* was selected to enhance *Ridge Racer*'s scenery. "Because I was on the team that made the *Galaxian* arcade, so I determined to include this excellent creation in honour of my old boss," Sakagami smiles. He clearly has great affection for *Galaxian*, and the manner of its inclusion was exciting for Sakagami: "I was shocked, because the day after we'd had this idea I found that it was already implemented in the software. The previous night, I delivered the visual materials to our lead programmer and just told him, 'Look, this is how you should configure the screen. Would you put *Galaxian* in there?' I don't know if he was just really busy with other work at the time, but his only response was a slight nod; and then, when we booted the game up the next day, there it was, almost perfectly implemented and only requiring a couple of minor adjustments. I remember being really excited by this!"

With loading times effectively concealed beneath the pixelly wonders of Namco gaming circa 1979, the PlayStation *Ridge* team's final and most important challenge was to ensure that this version of the game replicated, or at least came close to replicating, the cutting edge *Ridge Racer* coin-op. Ironically, one solution compounded another problem, as Sakagami explains: "Because we imposed this limitation whereby all of the game data was retrieved at once, drawing the graphics became a really difficult task. To ensure certain texture resolutions and capacities, we made many different texture designs by modifying identical textures from the same 16-colour palette."

The PlayStation was comparatively powerful in the context of home consoles, but it was no match for Namco's System 22 arcade board. To get past the discrepancy, Sakagami says, his team "put everything into coming up with various schemes and devices [to cut corners]. To be honest," he continues, "a third of the information that users saw on screen was the road surface. This was an important factor in reproducing the sense of speed that the *Ridge Racer* arcade had. And we decided to use high-resolution textures for the road surface, rather than normal resolution ones."

The coin-op's constant 60 frames-per-second display would remain out of reach until 1997 (see 'The Perfect Drive' boxout), and there were other conversion challenges that the PlayStation *Ridge* team struggled to meet, as Sakagami reveals: "In the arcade version of *Ridge Racer* the camera is located at a slightly lower level than the car's window, which is to make the game feel quicker. But when we tried to replicate that camera position in the PlayStation version, it always resulted in the road surface textures clipping, or appearing to flash. In simple terms, the more seams there are between polygons, the more easily this can be avoided; but to display so many polygons while also protecting the 30fps display we'd achieved was a really difficult task. We did some balancing while modifying all of the car and course data, and we polygonised the white lines on the road surface, which would otherwise have been really jagged. We ended up finding better balance through trial and error, in spite of the limitations of the hardware."

Ridge Racer was unique and hugely influential on the subsequent course of arcade and console racing games, and the series continues to be popular in Japan. While detailed driving sims have been more fashionable in recent years, the carefree nature of the *Ridge Racer* series, with its daft sense of speed and scintillating 'drift' routines, deserves to be appreciated. Yozo Sakagami concurs, explaining his love of the original: "I like the sense of speed and the drifting, and also the sound. Even though *Ridge Racer* doesn't feature real cars, I think it presents great entertainment as a game. There are so many car games, but *Ridge Racer* is different from other companies' racing games: even for people who can't drive in real life, if they play *Ridge Racer*, they get a sense of how good it must feel to drive fast."

» Some Namco promotional material showing a *Ridge Racer* arcade cabinet in all its glory.

» Namco's past and future were caught together in the transition from 2D to texture-mapped 3D advanced by *Ridge Racer*.

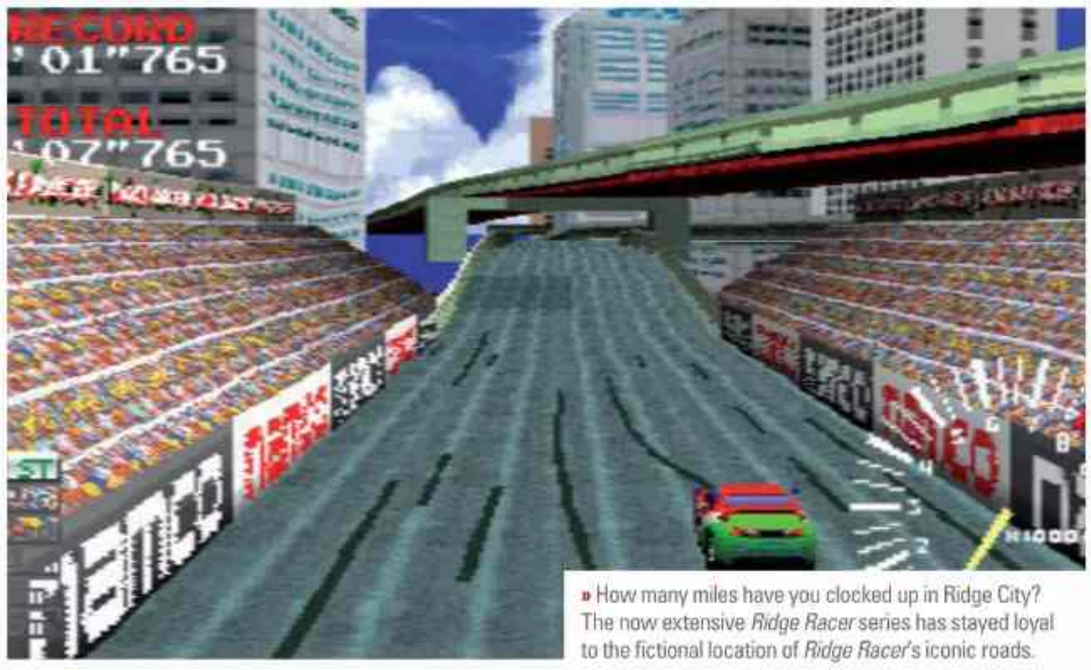
DEVELOPER HIGHLIGHTS

PAC-MAN
SYSTEM: ARCADE (PORTED TO VIRTUALLY EVERY FORMAT)
YEAR: 1981

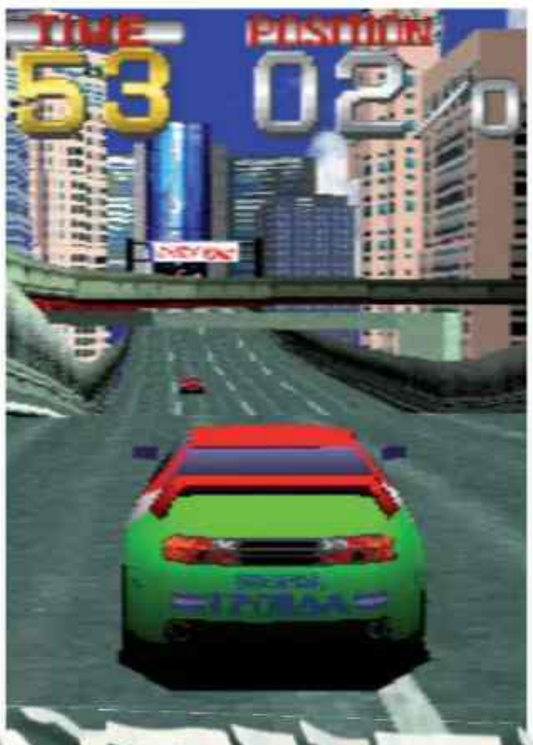
STARBLADE (PICTURED)
SYSTEM: ARCADE
YEAR: 1991

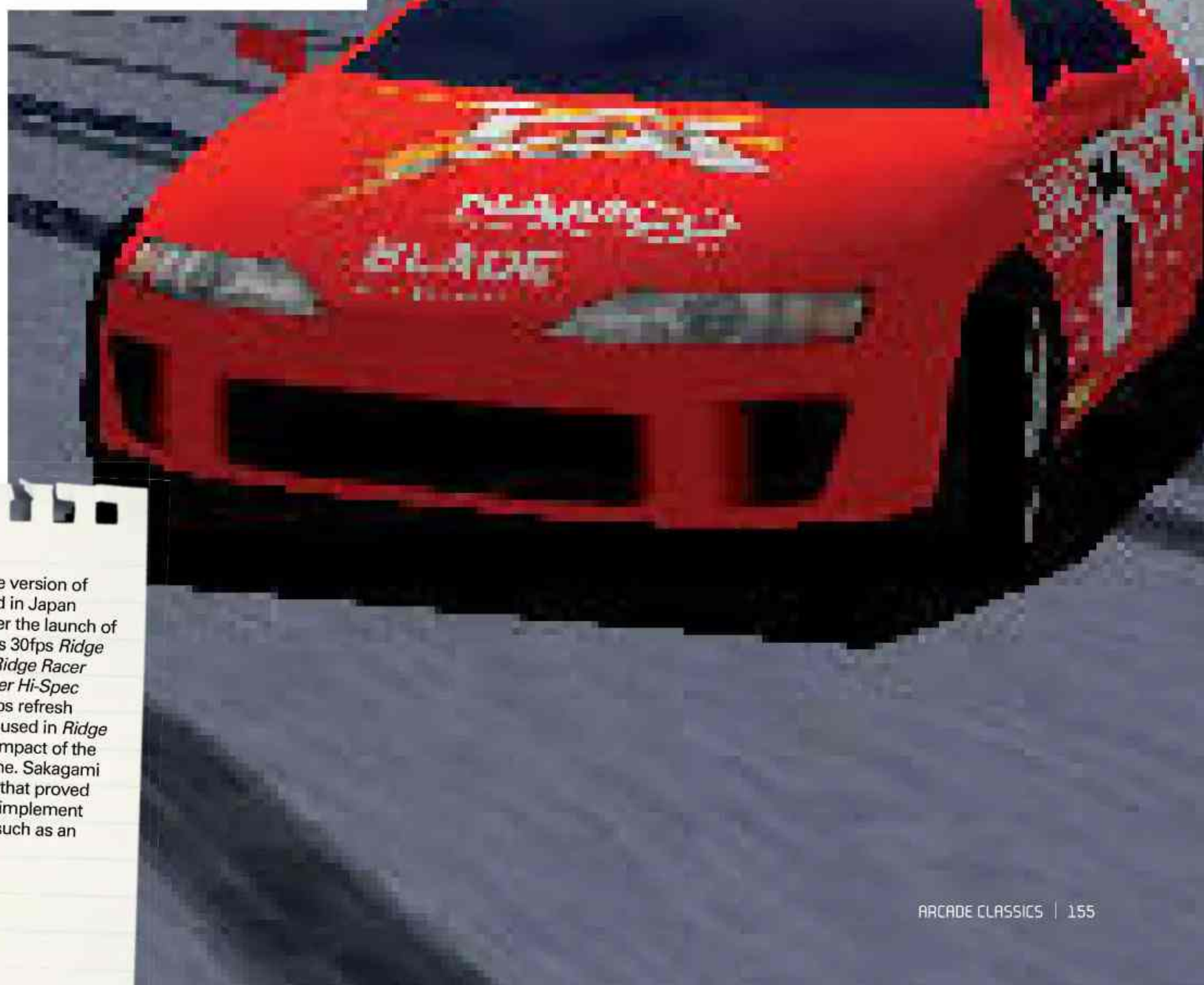
YUU YUU HAKUSHO
SYSTEM: SUPER FAMICOM
YEAR: 1993

"If we had gone with a Formula 1 style of racing game, would Ridge Racer have been so loved by players?" TANAKA ON WHAT MIGHT HAVE BEEN



» How many miles have you clocked up in Ridge City? The now extensive *Ridge Racer* series has stayed loyal to the fictional location of *Ridge Racer*'s iconic roads.





THE PERFECT DRIVE

The definitive console version of *Ridge Racer* appeared in Japan exactly four years after the launch of the PlayStation and its 30fps *Ridge Racer*. Bundled with *Ridge Racer Type 4*, the *Ridge Racer Hi-Spec Demo* achieved a 60fps refresh rate and also featured Gouraud shading, as used in *Ridge Racer Type 4*, to further enhance the visual impact of the original PlayStation *Ridge Racer* game engine. Sakagami and Co had wanted to hit 60fps in 1994, but that proved impossible: "Many of the ideas we couldn't implement in *Ridge Racer* turned up later in the series, such as an arcade-perfect 60fps refresh rate..."

POINT BLANK

KABLAMMO! Point Blank burst into arcades in 1994, determined to inject them with some quirky gameplay that was both family friendly and trigger happy. Sorrel Tilley apprehended designer Yutaka Kounoe to find out more...

Inexplicably titled *Gun Bullet* in Japan, *Point Blank* offered the unexpected. While most companies were building towards realism, Namco had other ideas. Yutaka Kounoe himself isn't a fan of gore. "I'm not sure it's morally right to make a living through ultra-violent games, but the development department were a little more flexible about designing them," he explains. "However, to make this game appeal to a wider demographic, we held back on the onscreen blood. I wanted to make *Point Blank* attractive to couples on dates, so I made sure there wasn't a drop of blood in any of the debris flying about. Even in *Tekken*, a game we created that allowed you to savour the exhilaration and satisfaction of decimating your opponent, we used CG effects that look like blood, but upon closer inspection, there really isn't any. Actually, the *Point Blank* prototype was a serious game with digitised photo graphics, in the style of *Lethal Enforcers*, but with Konami and Taito already having hits on the market, it was Namco's preference (and mine) to take on a new challenge. We decided to make a wacky, comical mini-game collection. The finance department didn't see the value in it and said it was no good, but we were determined to work day and night to create a fun game."

Kounoe had just finished working on the rail shooter *Lucky & Wild*, which used a fixed-position light gun. The first challenge in *Point Blank*'s development therefore would be the creation of an all-new, wired gun. "The recoil was the biggest problem in the gun's development. The concept was born out of an obsession of my boss, Shigeki Tohyama, who was Namco's resident Doc Brown character. Tohyama was a very unique individual, always beavering away on a strange invention.

"The electronics team carried out repeated experiments with the recoil gun under Tohyama's direction, but these guys were nearly in tears with frustration – 'We can't get the recoil

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IN THE KNOW

- **PUBLISHER:** NAMCO
- **DEVELOPER:** IN-HOUSE
- **RELEASED:** 1994
- **PLATFORM:** ARCADE, PLAYSTATION
- **GENRE:** LIGHT GUN SHOOTER

» *Point Blank* also featured a *Street Fighter II*-style trash-the-sports-car bonus stage.

we need!', 'The product's gonna be no good!' We had stressed the importance of blow back, but the components couldn't deliver a high enough voltage, so the kick was disappointing. Luckily, Tohyama was an adaptable boss with far-reaching knowledge and construction skills, and inventing was his forte, so he said 'Why not try increasing the voltage only at the precise moment you activate the solenoid?'" For readers without degrees in electronic engineering, a solenoid is a coil of wire which converts electrical energy into hydraulic motion – in other words, the perfect component for a gun recoil mechanism. "With Tohyama's hint, the team succeeded in achieving the powerful kick we were looking for." Kounoe also let slip that during his time at Namco, he filed for a patent on an innovative reloading mechanism using the base of the gun. If you've ever seen an action movie, you will surely be aware that handguns are commonly reloaded by sliding a magazine into a hole at the bottom of the grip. Dreams of re-enacting scenes from *Bad Boys* were sadly dashed, though. "Games with this feature would have been more unique and realistic, but it was never used, since I didn't throw myself into any other gun games after *Point Blank*."

"There's one more interesting thing about the GunCon's development," Kounoe adds. "It could read the screen coordinates to within a single pixel without failure, thanks to the tenacity of Namco's employees. With such perfect accuracy, we were able to create our finely tuned level designs. However, when the cabinets were about to be shipped from the factory, they discovered a minute error in the guns' initial settings. So right at the end of development, I had to oversee the production of a manual on how to recalibrate the gun sights! When you're working on a groundbreaking new product, things can happen that no one is prepared for. An important lesson!"

Kounoe was no stranger to hard work. Most projects he was involved with at Namco required long hours and sleepless nights. "When I was making *Point Blank*, I entered the data for every stage all alone and by myself. This data included enemy frequency and location, probabilities, and so on. All stages, multiplied by the four difficulty levels, multiplied by the two player modes, made lots of categories for fine tuning, and the development server we had at that time was slow. So every morning at 3am I would ride my bike to Namco and work on data alone in the dark office. In the early hours when the place was deserted, I had the server all to myself and I could use it with more efficiency, but I was working in the shadows, thinking 'Is a ghost gonna appear any minute now?' I jumped out of my skin when the bosses arrived at 7am and tapped me on the shoulder! It's a good memory though, putting all my effort into creating one game."

Despite his own herculean efforts, Kounoe still attributes much of *Point Blank*'s success to teamwork. "One of the reasons it's so perfectly tuned and patiently made is that when it was in production, all kinds of people on breaks from other projects would drop by to try it out. Even now I feel overjoyed that I finished development of a hit game safely – and no ghosts appeared!"

DEVELOPER HIGHLIGHTS

DIG DUG
SYSTEM: ARCADE
YEAR: 1982

LUCKY & WILD (PICTURED)
SYSTEM: ARCADE
YEAR: 1992

TEKKEN
SYSTEM: ARCADE
YEAR: 1994

DOCTOR, DOCTOR...

"AT THE BEGINNING of the project we planned ideas by making simple one-page pencil drawings. We had about 60 of these idea sheets lined up so we could consider the variety. On one of them I had written 'Save the old geezer', and that was the start of Dr Don and Dr Dan. They became mascot characters and ended up being painted on the side of the cabinets. The characters' look was decided by gathering ideas from all the designers on the project and holding a contest. I made a rough sketch just to show them my initial ideas for the characters – one round, the other tall and thin. It must have made quite an impression on them, because all of the submitted mascot candidates were almost identical to my original sketch! I wanted them to look like sombrero-wearing Mexican brothers, but the final design was kind of 'safe' – a *Sesame Street*-type odd couple."

» Ninjas can be deadly. Even cardboard ones.

» I was stung by a bee once. Twenty quid for a jar of honey!

» The octopus stage was apparently very popular with the ladies. Nobody knows why.

» Don't count your chickens before you frag them. Seriously, there's no time.

THE STORY OF STRIDER®

When Capcom released Strider in 1989, little did it know that it was creating an iconic, enduring franchise. Darran Jones swings his Cypher and speaks to key staff behind the series

It's been 26 years since Strider Hiryu first swung his Cypher sword and made that dizzying run down an exploding mountainside that captivated all who saw it. Since then he's been something of a recluse, using his ninja skills to hide in the shadows and only occasionally coming out to shine, but otherwise content to simply cameo in a number of other Capcom games, particularly versus fighters where his insane ninja skills are put to extremely good use.

To celebrate his 25th anniversary, Capcom unleashed a brand new game, *Strider*, which aimed to appeal to the orginal fanbase, as well as a brand new generation of gamers. It's actually a highly enjoyable game, even if it's not quite as good as the 1989 original.

"I have never felt that *Strider* became successful," reveals original creator Kouichi 'Isuke' Yotsui, when we ask him about the popularity of the ninja he helped create in 1989. "However, while we were making *Strider*, we always felt that we were in middle of creating a very entertaining game."

He's right as well. *Strider* is an incredibly enjoyable game, one that pushed graphical boundaries when it was first released. Taking on the role of Strider Hiryu, your aim was to bring down the evil dictator Grandmaster Meio, armed with just your Cypher laser sword and your insane agility. ▶

» This section of Strider's last game tests gravity and your reflexes. Wimps need not apply.

> "We always felt that we were in middle of creating a very entertaining game"
>
> Kouichi Yotsui

» Yes we've shown a variation of this screenshot so many times, but it remains an amazing gaming moment.

> "We had trouble keeping the amount of data under what was available"
>
> Kouichi Yotsui

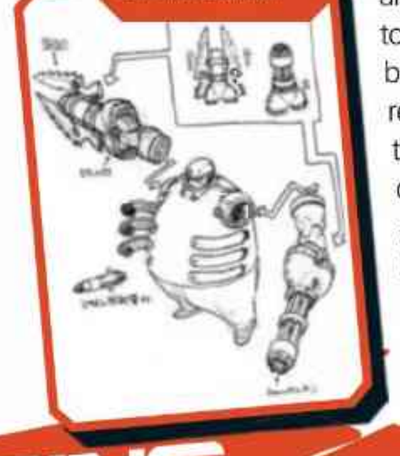
» Hiryu even manages to look cool when he dies. Bless him.

▶ Hiryu could swing up gantries, run down mountainsides, leap huge chasms and even operate in zero gravity. He was quite simply magnificent, but he also caused issues for Yotsui, who struggled with the technology limitations of the time. "We had trouble keeping the amount of data under what was available," he admits. "Hiryu's various action movement data had taken up more than half of the whole graphic data amount space."

And yet many would argue that it's worth it. Watching Hiryu in motion as he climbed walls, sliced his way through enemies and nimbly avoided enemies was mesmerising, and it's pleasing to see that new developer Double Helix Games has managed to retain his deadly grace for its reboot. As far as Yotsui was concerned, Strider's graceful animation was always the thing that drove his game. "It was the most important thing," he explains to us. "This is an action game, therefore the player should be able to enjoy it by just controlling Hiryu. We tried to make players be entertained by just making Hiryu run, jump or go through unknown environments. By adding movement such as jumping, running, sliding, clinging and climbing it will be even more entertaining. We felt that defeating unexpected enemies that appear in front of you by using all those movements would give the players extreme pleasure. To enable all these cornerstones, Hiryu's agility had to be the most important [thing] of all."

In addition to Hiryu's impressive athleticism, it was the game world itself and its weird and wonderful bosses that really helped separate it from its arcade peers. *Strider* had dramatic set pieces that ranged from running down an exploding mountainside to hitching rides on the backs of various dinosaurs, while his travels took him from the snowy slopes of Siberia to the heart of a floating battleship. Variety was the spice of life in *Strider*, and this was none more apparent than when facing off against its insanely nutty bosses. "We created multi-cultural and unfamiliar looking enemies to surprise players," continues Yotsui when quizzed about *Strider*'s exotic art design. "Creating these enemies was also important to expand the world within the game."

And what magnificent creations those enemies were. Robotic gorillas, brash Amazonians, metallic dinosaurs and an airborne pirate all vied for your attention, while even the lowliest of enemies felt alien and unique. You never forget the time you flew around the anti-gravity boss, desperately pummelling the fire button before you're flung into a nearby wall, or watching a group of Russian dignitaries transform into the hammer and sickle-wielding Ouroboros. It's a testament to their timeless design that so many have been included in Double Helix Games's reboot, but which is Yotsui's favourite? "I like the visual style of Lago Mechanic, the abilities of Anti-Gravity Device, Mecha Pon's charm and the clever functions which Ouroboros has," he tells us, clearly warming to the subject. "I like Solo's coolness, Kuniang MA Team's beauty and the dignity which Grandmaster Meio has. Yes, it's safe to say I like all of them."



» He might be a sub-boss, but he's still created with lots of care and attention.

Gamers agreed, and *Strider* became a big success for Capcom, no doubt helped by the Manga comic that had been released in 1988 (in collaboration with Moto Kikaku) and the 1989 NES game that followed a few months after Yotsui's arcade game. The NES game is quite interesting because it's a completely different beast to Yotsui's effort, playing to the strengths of the host hardware but clearly losing out as a result.

You still play as Strider Hiryu, but the pace of the game is greatly diminished, making him feel slightly less effective as a result. The story is also different to the arcade game, and a little more detailed due to the nature of the platform it's on, making it more in line with the story told in Tatsumi Wada's original manga anthology. There are Metroidvania-like design aspects to the game as well, with the ability to return to previous levels once new power-ups have been acquired. While it's a fun addition to the *Strider* canon, it ▶

» While the NES game is an enjoyable adventure it's not a patch on the superb arcade game.

THE MISSING STRIDER
The game that Grin was making

It's widely known that Capcom had commissioned Grin to make a game about Strider as far back as 2008. What isn't known is what type of game it was going to be. After extensive digging an anonymous source was able to confirm a few things about the title.

"Grin made the deal with *Strider* overlapping *Bionic Commando* before anyone knew how *Bionic Commando* would be received. At that time I think that relations with Capcom were good. I guess they started to outline a new project thinking *Bionic Commando* would be a hit." We've thought this ever since Grin was revealed as the developer, as *Strider* would have fit perfectly into its two-game template.

Our source goes on to reveal the following about *Strider*'s gameplay. "It took many different turns. First we did a super abstract design that was completely unique. That was the first take. Then the project landed in the hands of Grin Barcelona. From that point I have absolutely no idea."

Capcom went on to approach Grin with other smaller titles, including mentioning *Mega Man*, but the ideas were eventually dropped, the *Bionic Commando Rearmed* team was separated and Grin itself closed down a year later.

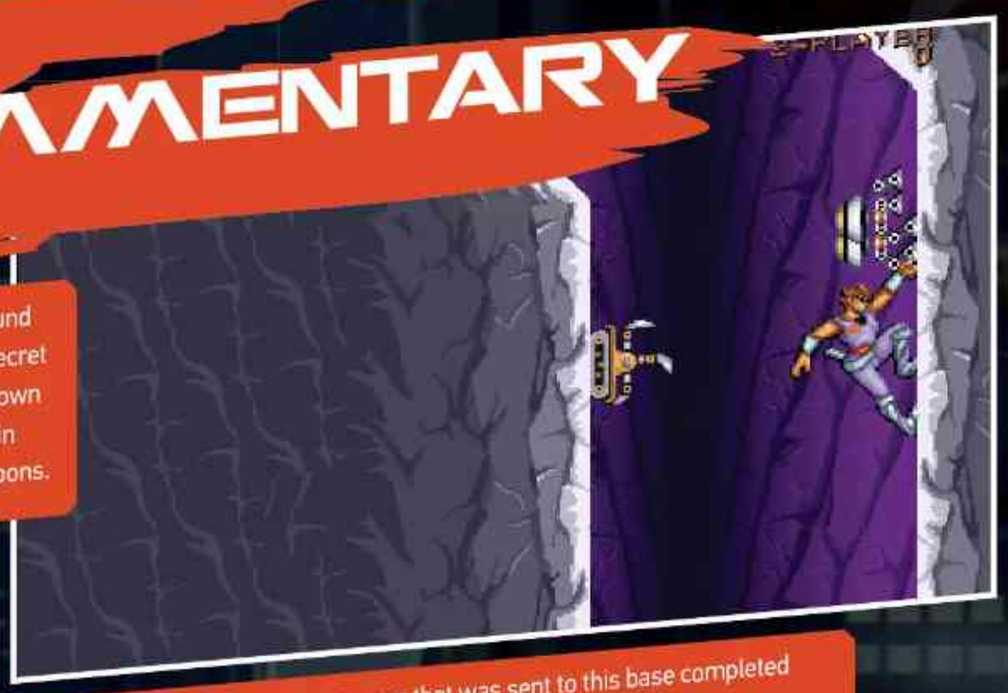
STRIDER: THE DIRECTOR'S COMMENTARY

Kouichi Yotsui tells us the story and gameplay mechanics behind Strider's iconic second level

©John Szczepaniak

1 The entire Eurasian continent is under Grandmaster Meio's control. After completing the mission at Kazah Federation's capital city, Hiryu is trying to escape from the continent by running through the whole of Siberia while Siberian wolves attack him.

2 Hiryu manages to escape the wolves by running into an underground tunnel. Hiryu discovers this tunnel is in fact Grandmaster Meio's secret base. Most of the weapon manufacturers who brought Meio's anger down on them and were sent to Siberia are transported here to be engaged in developing new types of weapons. Mecha Pon is one of their test weapons.



3 One of the manufacturing teams that was sent to this base completed these devices and the Anti-Gravity Device. By using the Anti-Gravity Device, Meio managed to float the new moon, The Third Moon, which made him very happy. It is said that this was the moment when the plan to burn down the whole living existence on Earth flashed into Meio's mind.

4 I am sure you have noticed that the Flying Mosqueman is the one who delivers items to the traitor Hiryu. This was a small harassment towards Meio by the manufacturers that were sent to Siberia.

5 This is the bounty hunter Solo. His powered armor is designed on the mosquito. Mosquitos existed on earth long before human beings were born. Back then they were already the most developed and completed (perfected) creatures. As long as they do not get swatted with a big clap! [Makes clapping noise]

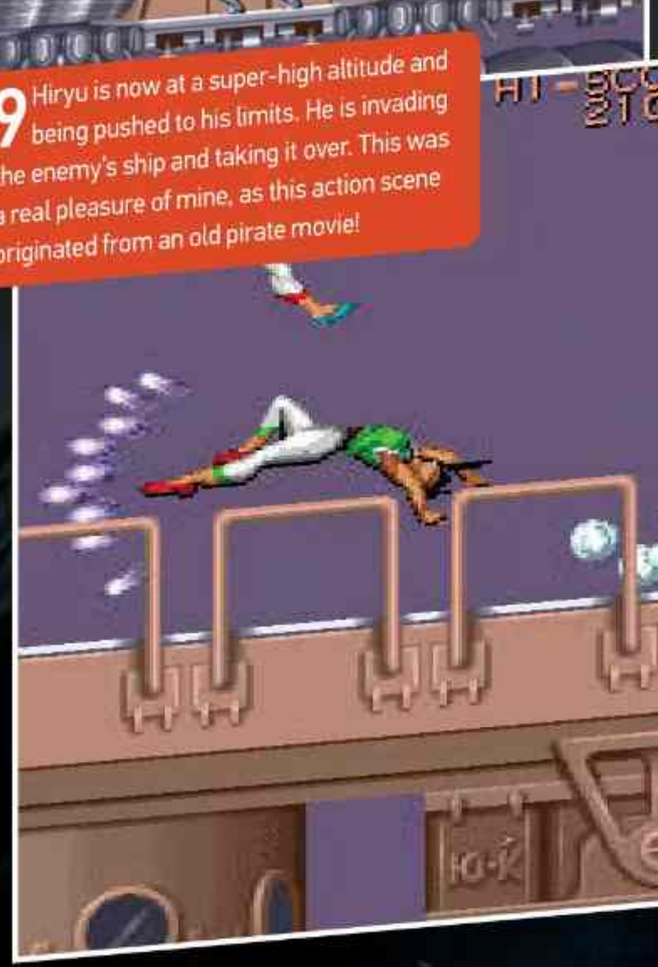
6 Back then we were drawing *Strider*'s gaming map on pieces of paper using pencils. To draw this slope we had to stick so many papers together, and while doing this it made us scared. We started thinking, 'is sticking this many papers together really worth it for such a simple-minded and silly idea? Aren't we just going to become a laughingstock?'

7 In arcade games, the second level carries a very important rule. We have to make players who have learned the game's controls on the first level think, 'we want to see more of this game!' For that purpose, we added speedier-developed scenarios and more venturesome changes. The match between the players and us always gets settled on the second level.

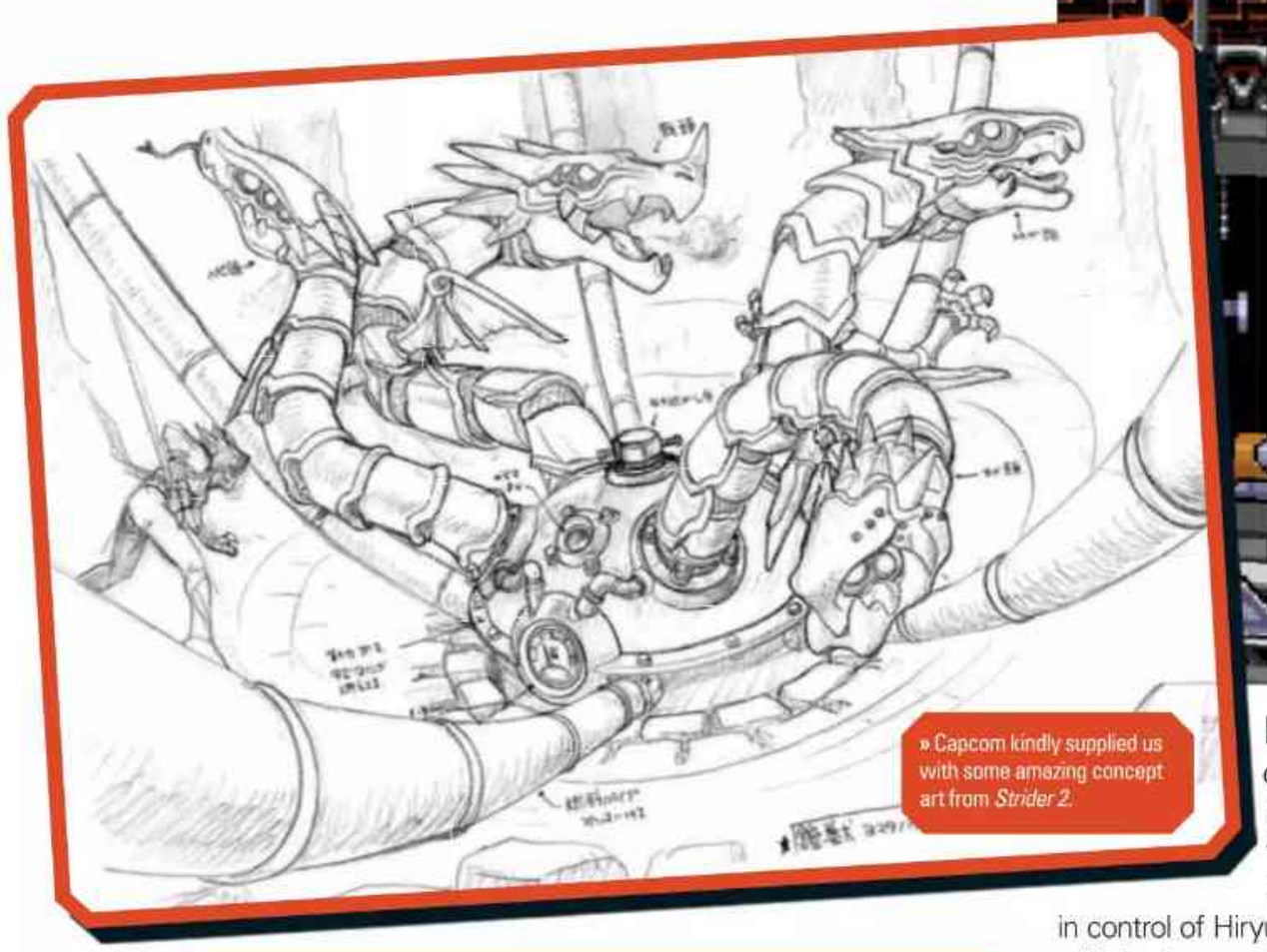
8 While Hiryu was running through Siberia, he was chased by Kuniang MA Team's airship group and suffered a surprise attack. Hiryu flies between airships to fight them. The name Hiryu means 'Flying Dragon', so he flies freely in the sky and essentially becomes a dragon running across Siberia.

9 Hiryu is now at a super-high altitude and being pushed to his limits. He is invading the enemy's ship and taking it over. This was a real pleasure of mine, as this action scene originated from an old pirate movie!

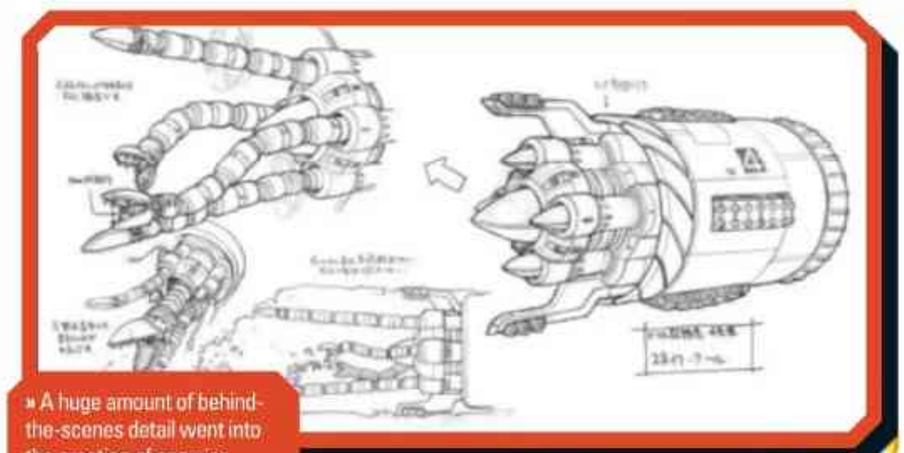
10 Hiryu is fighting against enemies who have dance-like movements and perform beautiful Taijutsu (a sort of martial art). Kuniang MA Team, who are also sky pirates, know of Meio's flying battleship, Balrog, as they have been overpowered by it in the past.



» *Strider II* is the one weak link in an otherwise solid chain.



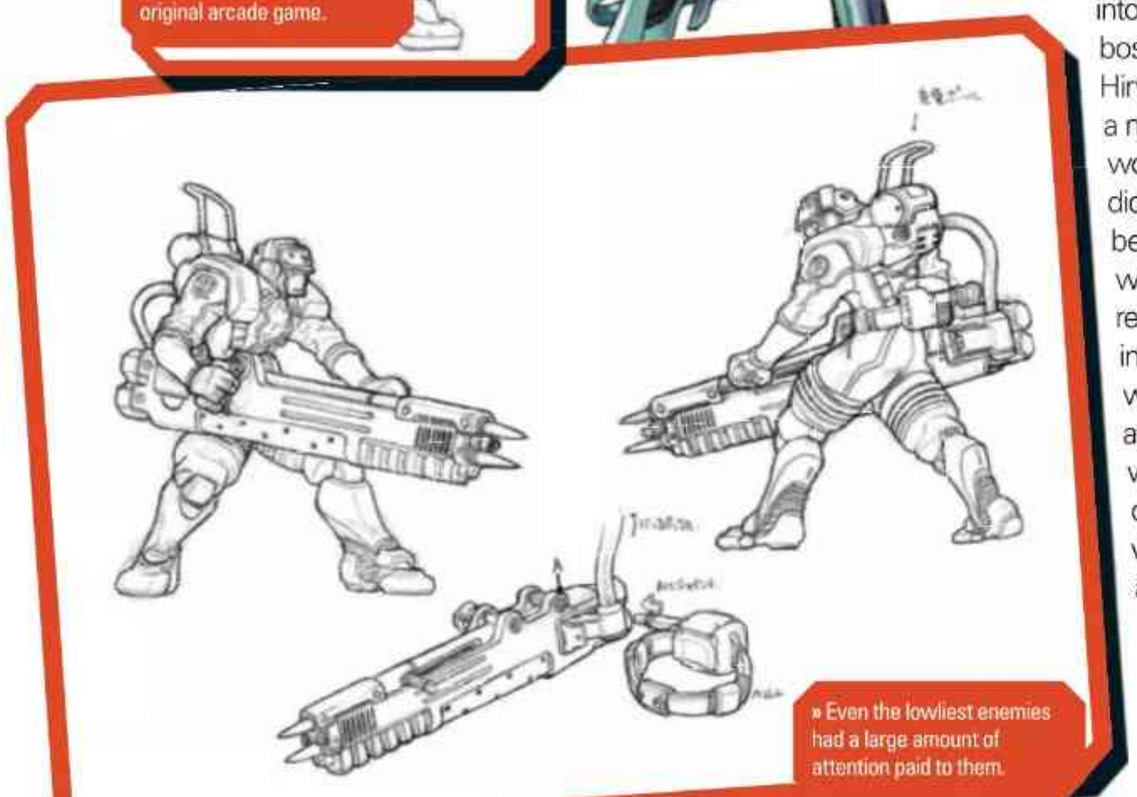
» Capcom kindly supplied us with some amazing concept art from *Strider 2*.



» A huge amount of behind-the-scenes detail went into the creation of enemies.

» The design of *Strider 2* follows on closely from the original arcade game.

» Solo returns in *Strider 2*, so he's been given a suitable upgrade over his first look.



» Even the lowliest enemies had a large amount of attention paid to them.

▶ lacks the grace and fluidity of Yotsui's game, a thing that becomes far more noticeable when using wall jumps or climbing. You never feel quite as in control of Hiryu as you do in the arcade outing, which takes away from the game. It's still a robust action game – something Capcom could turn out in its sleep during its NES period – but it pales in comparison to Yotsui's interpretation of the ninja.

Home conversions of the arcade game soon followed, with the majority of home computer versions being handled by US Gold, which passed coding duties to Tiertex. Sega did its own conversion of *Strider* for its Mega Drive and Master System, while the long-gestating PC Engine game (it was first announced in 1990 but released in 1994) featured animated cut-scenes, Red Book audio and a brand new level. Tiertex's conversions were hit and miss for the most part, with its 16-bit conversions fairing better, although it's impressive just how much of the original arcade game the various conversions could fit in. The Sharp X68000 is the clear winner, but was hardly a fair comparison due to its sheer amount of power and its actual cost (around £1,000).

Tiertex nevertheless managed to impress Capcom, and soon secured the rights to make a console and computer sequel, 1990's rather disappointing *Strider II*. Interestingly, it starred a brand new Strider, called Strider Hinjo, who now sported a gun in addition to his Cypher but could also turn into a laser-spewing robot when engaging bosses. He was otherwise identical to Strider Hiryu, with his own one-man crusade against a new superb villain. Chris Brunning, who worked on the home computer versions, did tell us the reason for the similarities between the two Striders. "The character was the same in the versions we did, just re-coloured," referring to the sprite used in Tiertex's arcade conversions. "That was an internal decision as far as I am aware." He goes on to reveal that there was no involvement from Capcom from a developer point of view, which may explain why it's just not in the same league as the arcade game that inspired it.

This wasn't the first time that Tiertex had made a non-computer sequel to a popular coin-op – *HKM: Human Killing Machine* was a sequel to *Street Fighter* – so we were keen to know if Chris and the rest of the team felt any pressure while working on the home sequel. "Not a great deal," he honestly tells us. "I believe it was only 'cult' popular really."

Strider II went on to receive decent scores on home computers, with the Spectrum version being particularly popular. It's not a good game though, failing to capture the sheer atmosphere that the original game oozed from every pixel. Despite this, Chris feels that Tiertex did get some things right, revealing, "I think it captured the main gameplay elements of *Strider*, the agility."

The Mega Drive, Master System and Game Gear versions came out a little later and were known as *Journey From Darkness: Strider Returns* in the US. Considering the power of the host machines they were all far weaker than the home computer counterparts, let down by clunky controls, drab-looking levels and poor stage design. While Strider Hinjo no longer transforms into a robot, his new shuriken-throwing shenanigans add little to the game and it's little wonder that Capcom conveniently ignores all versions of *Strider II*.

It may have ignored the dull platformer it had allowed US Gold to licence, but Capcom certainly wasn't ignoring the fact that *Strider* still appeared to be popular with gamers. In fact, Capcom was planning a sequel of its own…

Capcom had released *Marvel Vs Capcom: Clash Of Super Heroes* in 1998 and tested the waters by including Strider Hiryu as a prominent playable fighter. Gamers were instantly drawn to the acrobatic ninja, giving Capcom the confidence to continue with its own sequel. It wouldn't be easy however, as Yotsui had long since left Capcom. In fact he'd already made his own spiritual successor to *Strider* in the form of Mitchell Corp's delightfully nutty *Osman*.

Step forward Sho Sakai, who found himself as art director on the highly anticipated sequel, which was first released in arcades in 1999 before being ported to Sony's PlayStation in 2000. *Strider* may have seemingly lost its heart with the departure of Yotsui, but just one play of Capcom's sequel was enough to know that the developer knew exactly what it was doing. "There was naturally lots of pressure," begins Sakai about the challenging sequel, "but I was also deeply honoured to be able to work on the design of the sequel to the legendary *Strider*, which more than compensated for the pressure I felt."

And that pressure was palpable because *Strider*'s fan base is small but incredibly loyal. Sakai definitely felt it, finding himself in the same situation as current developer Double Helix

» At the beginning of each stage you're treated to these cool cut-scenes.

Games. "The [hardest thing was] the need to satisfy the diehard," Sakai continues. "It was tough to strike the right balance: if you keep things too similar to *Strider* then the sequel wouldn't be interesting, but if you change too much then fans would not accept it."

The solution was to effectively remake *Strider*, with the final game featuring two of *Strider*'s original stages and many other elements, including retreads of memorable set pieces and notable bosses such as the bounty hunter Solo and the Kuniang MA Team. The first three levels of Capcom's explosive sequel could be tackled in any order, finishing off with a return to the floating battleship Balrog and another trip to The Third Moon, the base of Grandmaster Meio.

It was all topped off by some amazing new visuals that perfectly captured the spirit of the 1989 original. Although the gaming world was actively embracing 3D technology, Capcom wisely decided to make *Strider* 2.5D, with neat 3D backgrounds giving the game some impressive depth and slick rotation effects. "With the move to 3D backgrounds, we were able to make the levels more than just basic horizontal traversal against a backdrop," explains Sakai about *Strider 2*'s distinctive look. "Some of the enemies were created in 3D as well, so the confluence of 2D and 3D was one of the key aspects of the title."

Another key aspect was ensuring that *Strider 2*'s bosses were just as over-the-top as those found in the arcade original. Capcom's team happily obliged, delivering an impressive menagerie of foes in addition to those returning from *Strider*. Each of *Strider 2*'s stages were divided into smaller sections that typically ended in a boss battle. Memorable encounters include a skirmish with a robotic wooly mammoth, riding along the back of the gigantic Emperor Dragon (an encounter that's replicated in the new *Strider*) and taking out a huge Kraken. "Bosses are an important part of *Strider* for sure, and I think the highly original designs are what makes them so memorable," explains Sakai. "Although many bosses are quickly defeated, they still make a lasting impression, which is quite an amazing accomplishment."

One of the most impressive bosses is Strider Hien, who acts as a suitable nemesis for Hiryu and is unlockable on the PlayStation version. He's the entire creation of Sakai, who revealed the following interesting revelation about him. "In my original design, he wore a long-sleeved top. When I checked the pixel art, though, for some reason he had been drawn without any sleeves at all! Meanwhile, the cut-scene illustrations stayed true to my original design, so his sleeves are intact. Hien is the only character who sports summer and winter wear!"

Hiryu himself arguably remained the star of the show, with Capcom boosting his already powerful moves to make him more like the one-man army that appears in Double Helix Games's sequel and Capcom's *Vs* games. Infinitely faster than his 1989 counterpart, he's now got a variety of useful jumps – including a double jump – for quickly changing direction or propelling himself off walls and a useful boost attack that enables him to launch plasma waves from his Cypher, giving him a fighting chance against Grandmaster Meio's many generals.

Despite being a genuinely thrilling arcade game, *Strider 2* wasn't a success for Capcom, and while it was released across all regions ▶

FAN FICTION
The moment Double Helix knew it had to up its game

We'll admit to be a little concerned after hearing that Double Helix Games would be handling *Strider*'s reboot (although we're happy to be proved wrong). Even *we* didn't go to the following lengths though...

"Right after the game was announced at Comic-Con, we got an email from a *Strider* fan who had dissected the footage of the game found on the web," recalls a bemused Jorge Osequera. "He sent screenshots of every location in the footage that had the Kazakh star flipped. He included shots from the original game and did side by side comparisons to point out where we went wrong. We always knew that the old-school fans would be the most critical, but that email was a huge reality check for us. Just thinking about the process that this fan went through to make sure we got the details right really inspired us to double down on the details." If you're reading this article *Strider* fan, we'd love to hear what you think of the finished game.

> **"I think the highly original designs are what makes them so memorable"**
> Sho Sakai

» *Strider 2*'s lead artist Sho Sakai gets into character.

THE ULTIMATE NINJA

It's a deadly face-off as classic videogame ninjas do battle

RAIDEN
MOST LIKELY TO:
Whinge about his personal life
LEAST LIKELY TO:
Star in a proper *Metal Gear* game

NINJA HAMSTER
MOST LIKELY TO:
Beat up anthropomorphic rats
LEAST LIKELY TO:
Win this ninja showdown

ZOOL
MOST LIKELY TO:
Have an identity crisis
LEAST LIKELY TO:
Get sponsored by Iron Bru

JOE MUSASHI
MOST LIKELY TO:
Own a pet dog
LEAST LIKELY TO:
Properly train it

SCORPION
MOST LIKELY TO:
Look like a palette swap
LEAST LIKELY TO:
Get his own game

STRIDER HIRYU
MOST LIKELY TO:
Ride on the back of a brontosaurus
LEAST LIKELY TO:
Get another Tiertex sequel

LEONARDO
MOST LIKELY TO:
Say something *turtley* irritating
LEAST LIKELY TO:
Become a ninja hamster

RYU HAYABUSA
MOST LIKELY TO:
Lose his family heirloom
LEAST LIKELY TO:
Appear in any more good *Ninja Gaiden* games

ROUND ONE

RAIDEN VS NINJA HAMSTER

■ Ninja hamster or not he's still just a hamster, and Raiden cuts Metal Gears in half before breakfast. Raiden ends the battle by stepping on the hapless hamster before he's even had a chance to squeak.

WINNER: RAIDEN

ZOOL VS JOE MUSASHI

■ Although he's from the Nth Dimension, Zool is actually a pretty rubbish ninja. Joe Musashi easily jumps over the Chupa Chups Zool throws at him, returning fire with deadly lethal shurikens. Silly Zool.

WINNER: JOE MUSASHI

SCORPION VS STRIDER HIRYU

■ "Get over here!" screams Scorpion as he flings his trusty tethered spear in Hiryu's direction. Hiryu effortlessly slides under the incoming weapon and proceeds to slash at Scorpion with his Cypher. Win.

WINNER: STRIDER HIRYU

LEONARDO VS RYU HAYABUSA

■ Ryu immediately leaps into action, grabbing Leonardo and pulling off his deadly Izuna Drop. Unfortunately for Hayabusa, cheeky Leonardo simply retracts his head into his shell, leaving Hayabusa with a broken neck.

WINNER: LEONARDO

ROUND TWO

RAIDEN VS JOE MUSASHI

■ Realising the power of his opponent, sneaky Joe Musashi (from the Mega Drive version of *Shadow Dancer*) sets his pet dog on him. Raiden proceeds to bitch about his personal life, causing Joe and his faithful hound to slink off in disgust

WINNER: RAIDEN

STRIDER HIRYU VS LEONARDO

■ Trained by Splinter, Leo is the strongest of all four turtles. Years of training can't prepare him for Strider Hiryu's awesome skills though. Left shell-shocked, he soon sods off for some much-needed pizza with his brothers.

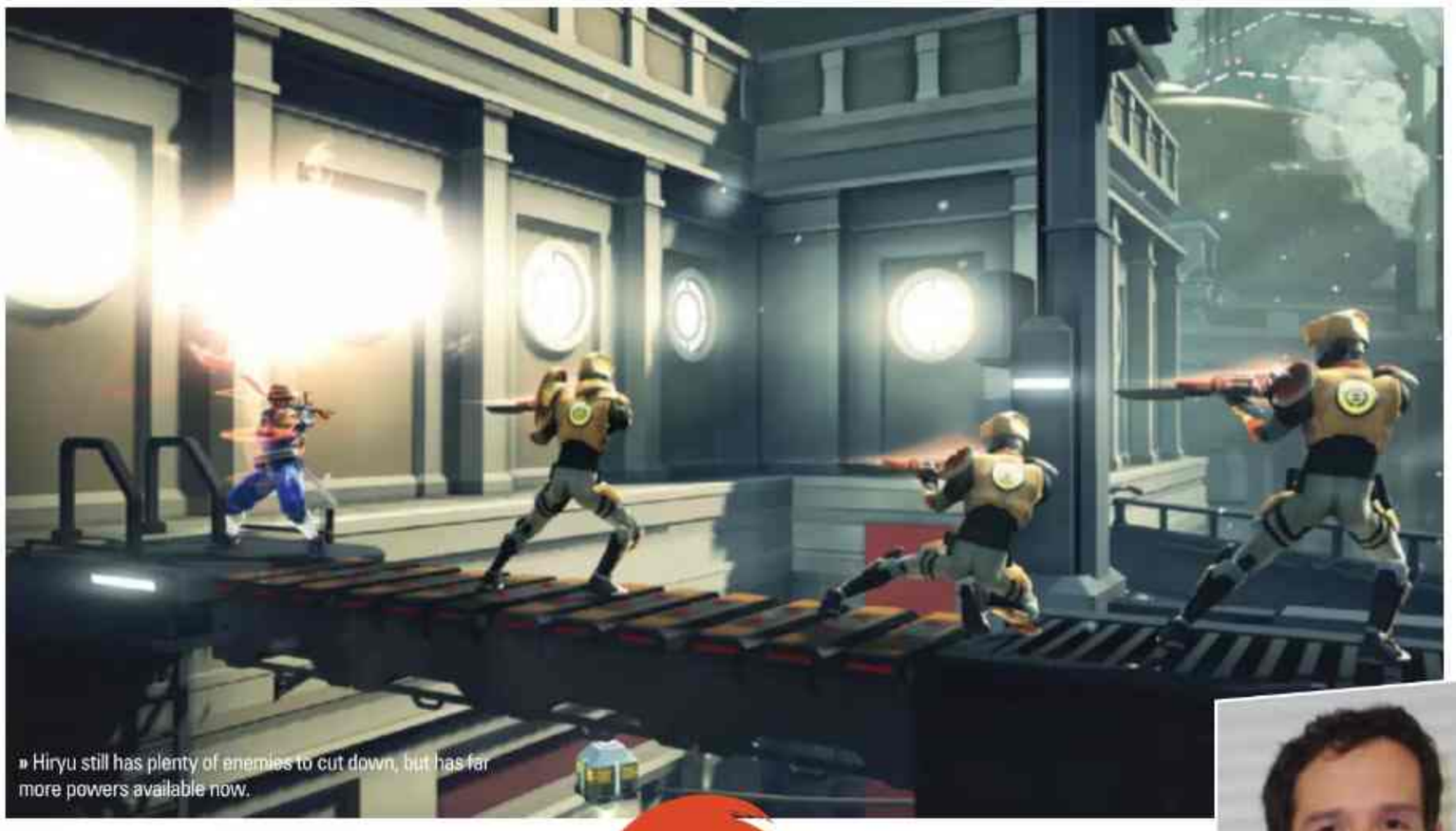
WINNER: STRIDER HIRYU

FINAL ROUND

STRIDER HIRYU VS RAIDEN

■ Confident that he won't lose a battle in a box out found in a feature that's entirely dedicated to him, a casual Hiryu wades in. Raiden easily cuts him down in seconds. Did we mention he cuts Metal Gears in half before breakfast?

WINNER: RAIDEN



» Hiryu still has plenty of enemies to cut down, but has far more powers available now.

» Fans of *Strider* will be pleased to hear that he remains as agile as he was in his earlier games.

▶ it remains a surprisingly low-key game, which is a pity considering its actual brilliance. Despite his fan base, Hiryu was once again relegated to the sidelines appearing in numerous cameos and the occasional versus fighting game in the intervening years. A *Strider* remake was revealed to have been in the works at Grin Barcelona in 2009, but was quickly cancelled by Capcom at its prototype stage. Grin itself disappeared shortly afterwards and the hope of a new game died with it.

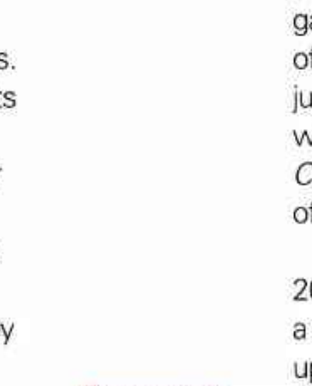
Just four years later however, Capcom used the San Diego Comic Con to announce the trailer of a brand new *Strider* game – to an ecstatic response. As the days passed gamers began to voice concerns due to the previous output of Double Helix Games, but as new information continued to drip out of Capcom HQ, it became clear that the studio did understand the importance of the franchise it had been handed.

"We love the *Strider* fans, both the older generation and the newer generation, and we take all the feedback from them very seriously," assures *Strider*'s producer Jorge Oseguera. "When the game was first announced, we were all very nervous for the reveal. We were confident in the game we were making, but first and foremost we wanted to hear from the *Strider* fans. It was such a relief once the trailer hit the web and the fans had positive things to say about the reboot. I still get goose bumps watching the reaction from the crowd at SDCC when Strider Hiryu first appeared on-screen."

It takes more than a good trailer to make a good *Strider* game however, and the biggest surprise about Double Helix's new *Strider* was that it plays out more like a Metroidvania, meaning the original NES game seems to be as every bit as inspirational as its arcade counterpart. What we've played so far suggests that is plenty of DNA from the original arcade game, but we were still keen to know the reasoning behind the team's new design choices. "We wanted to keep *Strider*'s fast action and fluid gameplay front and centre, but we also wanted to create a much more expansive and immersive backdrop that would support an adventure that takes multiple hours to unfold," admits Jorge. "While I wouldn't say that we are straight up Metroidvania, we're definitely influenced by Metroidvania games, and wanted to marry elements of that sort of non-linear adventure and exploration with *Strider*'s furious Cypher-slashing action."

Regardless of *Strider*'s new game direction, it's all for nothing if Strider Hiryu himself doesn't feel like the titular ninja. After completing the game several times it's clear that Double Helix knows what its doing. The controls feel fluid and precise, Hiryu himself powers through stages, while his repertoire of tricks is extremely impressive. It may not look like a *Strider* game (it's a little too drab-looking for our tastes) but it certainly feels like one. "The first thing we did was to make sure to nail Hiryu's core movement and Cypher-slashing gameplay," reveals Jorge. "We knew that if we couldn't get that perfect, the rest didn't matter. Beyond that, it was all about fleshing out the world and story. We're all fans of the original games so we really wanted to capture the essence of the classics. You'll see familiar themes throughout the levels as well as characters from the previous games. Tony Barnes (*Strider*'s design director) has been making games for over 20 years and is a huge *Strider* fan. In the early [21st Century] he created a bucket list of games that he wanted to make. *Strider* was in his top five. On top of that, we had the creative team from Capcom in Osaka, which included one of the original game's artists. I hope that gives the fans some comfort and lets them know that *Strider*'s in the right hands."

The one thing that does impress with *Strider* is just how good the new boss battles are. While a few new enemies appear, many of the mayors from the original game return and they all put up tough, challenging fights. In short, they act exactly as you'd expect them to and we couldn't be more happy. "Modern technology and an expansive game design have provided the opportunity to update and polish classic boss game mechanics, battle length and pacing,"



» James Vance (top) and Jorge Oseguera have been crucial to the success of *Strider*'s reboot.

» There are plenty of returning bosses, many of which are far tougher to defeat than before. It's a faithful update.

beings James. "Solo, the cyborg bounty hunter, for example, has always looked very cool and threatening, but had a limited set of actions and was quickly defeated. In this latest *Strider*, however, he realises his full potential with an arsenal of powerful attacks that will surely test players' skills in an extensive battle. It's been a challenge to update classic bosses, but seeing them do all of these things that you only fantasised about as a child has been very rewarding, not to mention very cool."

James also feels confident that gamers will enjoy the many new abilities that Hiryu now has at his disposal, revealing that the team looked both to the past and present to ensure that their hero still felt like the Strider Hiryu gamers know and love. "When developing the character for this latest *Strider* game, both the recent *Marvel Vs Capcom* and arcade iterations were analysed, and those characteristics which best served the gameplay and visual presentation of the character [were] implemented," he continues. "From a visual perspective, the character has been updated to match the artistic design and HD fidelity of current systems, but maintains the silhouette, colour scheme and key poses and animations of the *Marvel Vs Capcom* series, resulting in a fresh yet recognisable design. The core gameplay rests upon a refined iteration of Strider's bedrock of running, sliding, jumping and climbing, and is infused with actions from the *Marvel Vs Capcom* series as well as an array of new abilities."

Strider was released in 2014 and it proved to be a perfectly acceptable update of the classic franchise, although Capcom currently has no plans for a further sequel. It's a pity, but perhaps understandable. He might not have the legacy of some videogame icons, but there's no denying that the character has touched a lot of gamers in the last 25 years. "From the way he moves to the way he talks, he's the embodiment of cool," concludes James when we ask about Strider's enduring popularity with his fan base. "But it's a coolness born from the original design of the character that isn't necessarily good or evil, and certainly isn't topical or trendy. He's the timeless badass that everyone wishes they could be – that is why it feels so empowering to pick up the controller and become Strider Hiryu." We couldn't agree more. ✱

Special thanks to Laura Skelly and Maiko Hinson for making this article possible

THE UNCONVERTED

Arcade games that never made it home

ZERO GUNNER

■ **Developer:** Psikyo ■ **Year:** 1997 ■ **Genre:** Shoot-'em-up

■ You might well be familiar with the name *Zero Gunner*, but if you are it's almost certainly because of its excellent sequel *Zero Gunner 2*, which is one of the many worthwhile shoot-'em-ups on the Dreamcast. The original game is rather less well-known, having never received a home conversion. *Zero Gunner* arrived in arcades in 1997, powered by Sega's ageing Model 2 board. The game puts you in charge of a helicopter gunship in the year 2016, fighting to take back control of the world's militaries from terrorists. This flimsy premise is reason enough for you to take to the skies in Asia, the USA and Europe, blowing up all manner of other aircraft as well as bosses including battleships and massive planes.

The primary gimmick in *Zero Gunner* is the lock-on feature, which allows your helicopter to roam the screen while still directing fire at the targeted enemy – a feature that would later be expanded upon by the sequel, which offered full 360 degree rotation. In *Zero Gunner*, your lock-on capability is limited, with a helpful bar on the left of the screen showing just how much has been used. With that exception, the game feels vastly more traditional than its successor, with enemies heading down from the top of the screen.

There's a nice variety of stages available, from the deserts of Algeria to windmills in the Netherlands, but the game doesn't look tremendously good – stage backgrounds are repetitive, with little in the way of notable landmarks. Sound is also a little weak, with military-themed music that fits the action without ever grabbing your attention.

However, these weaknesses don't change the fact that *Zero Gunner* is underpinned by some extremely solid game design. Its conventional approach to the genre doesn't break any new ground in the way that *Zero Gunner 2* did, but nevertheless provides a challenging, satisfying blast. Level design is of a high standard and the bosses are excellent, with the multi-target battleship proving to be one of the game's highlights – just as a similar section did years later in *Under Defeat*. If you've played one too many bullet hell shooters and grown tired of them, playing *Zero Gunner* could be just the change you need.

CONVERTED ALTERNATIVE

UNDER DEFEAT 2006

While *Zero Gunner 2* did receive a home conversion, it's G Rev's blaster that feels closer to the original game, thanks to the limited helicopter rotation. You can pick this one up on Xbox 360 or PS3, but we still have a soft spot for the Dreamcast conversion.

» Lock-on ability is strictly limited in *Zero Gunner*, with this meter showing you how much time remains before you'll need to re-target the enemy.

» Unlike its successor, in *Zero Gunner* you'll always be facing off against enemies arriving from the top of the screen. This causes the game to feel a little less interesting.

» Targeting enemies is pretty simple – the first untargeted shot to connect with an enemy will place a crosshair on that enemy until it is destroyed or you stop shooting.

» While the scenery is varied by location, the muted colour scheme makes the backdrops look unnecessarily repetitive. It's a shame, as the international theme is otherwise good.

BEST LEFT IN THE ARCADE

ZAVIGA

■ **Developer:** Data East ■ **Year:** 1984 ■ **Genre:** Shoot-'em-up

■ *Zaviga* adds the extra dimension of height to vertically scrolling shoot-'em-ups, but somehow manages to be less interesting than the likes of *Zaxxon* despite being two years more recent. The key mechanic is the ability to change your ship's height – flying low opens you up to smashing into mountains and ground-based enemies, while flying high makes it harder to hit ground-based enemies as you're limited to dropping bombs on them.

The problem is that 98 per cent of the time, there's little reason to take the extra risk involved with flying low, as the game rarely includes any high-level obstacles to encourage you to swoop down. The top-down perspective also limits the game to two levels of height. With the game's most interesting mechanic rendered rather pointless, all that remains in *Zaviga* is a *Xevious* knock-off with uninteresting enemy patterns and less variety in scenery.

We're not surprised that Data East backed its other 1984 shoot-'em-up *B-Wings*, which was eventually converted to the Famicom. It wasn't the most memorable shoot-'em-up, but we're grateful for that fact that it spared home users this shambles.

GIGANDES

■ **Developer:** East Technology ■ **Year:** 1987 ■ **Genre:** Shoot-'em-up

» It's perhaps ironic that the biological horror stage offers some of the nicest sights in *Gigandes*.

■ **On first impressions, *Gigandes* is a mess.** The game is visually quite ugly for its time, and the tiny orb spacecraft fires some pretty weedy weaponry. Thankfully, the game improves massively when you learn what that orb design is for – your spacecraft is able to equip weapons on different parts of its body depending on where it makes contact with a power-up. Flying upwards into a power-up will provide you with that weapon on top of your craft, for example. Weapons can also be rotated around the body of the ship, allowing for four-way fire with all of your weapons. This provides a thoughtful approach to the shoot-'em-up genre that was atypical for the time.

You'll need the multi-directional fire, too – while the early levels consist largely of open air, assaults from all directions become more common and stage walls begin to appear, preventing frontal assaults on your enemies. It's a shame that Gigandes never made it home, as it could have been replicated pretty well on either the Mega Drive or PC Engine. But East Technology never developed any console games itself, and never appears to have had a big enough hit for other companies to pursue licensing.

CONVERTED ALTERNATIVE

HELLFIRE 1989

While *Hellfire* doesn't quite offer the same flexibility as *Gigandes* in terms of weapon choice, it does allow the player to switch between forwards, backwards, vertical and diagonal shooting to tackle some tricky stages. The excellent Mega Drive version is pretty easy to find and comes highly recommended.

CONVERTED ALTERNATIVE

MERCS 1989

It's an obvious pick, but Capcom's game remains one of the best in its genre. While Sega's in-house Mega Drive conversion lacks the multiplayer of the arcade release, it made up for it with a brilliant original mode in which each character packs their own unique weaponry – just like *FixEight*.

FIXEIGHT

■ **Developer:** Toaplan ■ **Year:** 1992 ■ **Genre:** Shoot-'em-up

■ ***FixEight* is the sequel to Toaplan's cult hit *OutZone*, a top-down shooter which took the *Commando* formula and turned everything up to 11.** *FixEight* adopts the same gameplay as its predecessor, increasing the number of playable characters to eight and refining the weapon system. Like *OutZone*, *FixEight* allows players to utilise a forward-facing wide shot or a straight stream of shots that can be fired in any direction. However, new charge pads replace the single-use power-ups of *OutZone*, making for far less frustration when you're looking to change. The changes enable the player to enjoy the excellent stages, which are filled with a variety of excellent hazards. Beyond the standard enemies, you'll be forced to contend with moving mid-air platforms and a maze lined with buzzsaws. The music is relatively bland, never quite reaching the heights achieved by its predecessor's tunes. However, the game is fast-paced and packed with carnage, adding technical proficiency to the excellent sprite work to produce one of the best-looking shoot-'em-ups of the early Nineties.

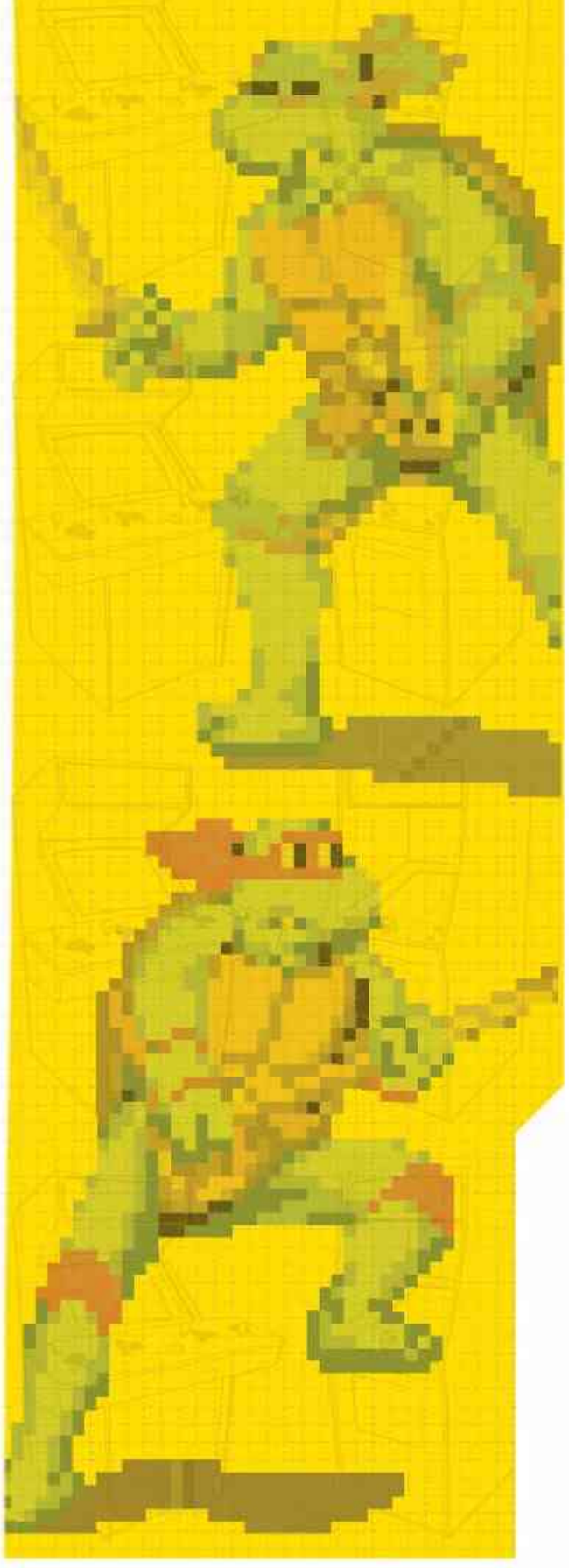
» The huge explosions in *FixEight* convey a great sense of carnage, especially when battling multiple foes.

IN THE KNOW

- **» Publisher:** Konami
- **» Developer:** Konami
- **» Released:** 1989
- **» Systems:** Arcade, Various
- **» Genre:** Scrolling beat-'em-up

Teenage Mutant Ninja Turtles

We take a definitive look back at one of the Eighties' most popular arcade games. Tonight, Martyn Carroll dines on turtle soup



***Teenage Mutant Ninja Turtles* is a perennially popular franchise (and yes, they were indeed 'Ninja Turtles', not mere 'Hero Turtles' – the change of name due to some silly censorship issues in parts of Europe that we'll pretend never happened). Just when you think it's finally died a death, a new comic, TV series, toy line, videogame or movie reminds us all that those reptilian rapscallions who shout 'Cowabunga!' and scoff pizza have been around for over 25 years, and will probably be around for 25 more.**

But no matter how long *TMNT* remains in favour, it will never be more popular that it was in 1990. This was the year when the phenomenon reached its peak and *TMNT* became an unstoppable force. The animated series was playing heavily on TV, the first movie was doing big business at the box office, and the tune 'Turtle Power' by pretend rappers Partners in Kryme was topping charts everywhere. And of course there was the *TMNT* coin-op from Konami, which was released in 1989 but by 1990 was established in arcades the world over.

If you'd been suckered into the *Turtles* craze then it was simply impossible to resist Konami's arcade game. Based on the animated series, it was a scrolling beat-'em-up where you went up against evil Shredder's army of Foot Soldiers and various bosses including Rocksteady, Bebop, Krang and the Shred-head himself. It was slick, fast and fun, with plenty of humour and jokes for fans, yet easily the game's finest feature was its co-op play. Some versions of the cab offered support for four players, allowing you and three mates to each take control of a Turtle and fight together.

The move list was pretty standard for this type of game. Bashing the attack button would result in a simple combo move, with your Turtle performing an impromptu back kick should you be approached from behind. Hitting the jump button followed by attack would perform one of three moves depending on your height: a flying kick (low), a diving kick (mid) or a vertical weapon attack (high). Finally, hitting attack and jump together would unleash your Turtle's special move. Leonardo, Michelangelo and Donatello all performed a sweeping attack capable of defeating multiple enemies with a single blow, while Raphael was blessed with a unique roll-and-kick combo that was useful against some bosses.

Despite the Turtles being faster than their foes and boasting powerful specials, the game has earned a reputation as a contemptible coin-muncher. It's true that the later bosses can be a fairly cheap, but they're certainly not invincible. In our experience, at the height of the game's popularity, players were always eager to pump in extras credits and continue, or buy-in and help out their buddies – surely a clear indicator that Konami had produced a winning coin-op that delighted both players and operators.

Konami must have been pretty pleased with the game too. Having already experienced huge success with its first *TMNT* outing – a platform/adventure game developed initially for the NES – the company wasted no time in bringing the arcade game home. It developed a well-received NES conversion, which expanded on the coin-op by adding a couple of exclusive new levels. Home computer rights, meanwhile, went to Brit publisher Mirrorsoft, which commissioned Probe to convert the coin-op to the Spectrum, Amstrad CPC, Commodore 64, Amiga, Atari ST and PC in 1991. Like a lot of arcade conversions, these releases suffered from single-fire-button syndrome, where players had to clumsily push up and fire to jump.

In recent years, the arcade game has popped out of its shell on a couple of occasions. It was included as an unlockable extra in the 2004 game *TMNT 2: Battle Nexus*, and was probably the best thing about it. In 2007, Ubisoft put the coin-op out on Xbox Live Arcade complete with Achievements and a co-op mode. If you're an X360 owner looking for a nostalgia trip, 400 MS points is a small price to pay to party like it's 1990. ✱

the expert

PROFILE

» **Name:** Patrick Wheeler
» **Age:** 30
» **Location:** Diboll, Texas
» **Key Twin Galaxies World Records:**
Metal Slug 3 [Arcade]
10,213,610 points
Sunset Riders [Arcade]
1,010,930 points
Jailbreak [Arcade]
9,999,900 points

Until recently, Patrick Wheeler held the Twin Galaxies' TMNT high score with a haul of 1,085 points. We find out the story behind the score and why he has no plans to reclaim the record...

■ Can you tell us how long you've actually be gaming for and what you like about it?
The past 22 years, starting with the NES at age seven. I credit games like *Battletoads*, *Contra*, *Life Force* and *Punch-Out!!* for giving me the skills necessary to compete at a higher level.

■ When and where did you first play *TMNT* and what were your initial impressions of the game?
I remember playing the game at a bowling alley when I was around ten years old. At the time I thought it was one of the most fun games I had ever played, because it was different from the typical platforming and shooting games that were common on game consoles during that time.

■ Why did you decide to have a crack at taking on the Twin Galaxies high score? Were you confident you could beat it?
Another *TMNT* player offered a bounty on the Twin Galaxies forum in 2008 and, since I already knew the game inside and out, it was an easy cash-in.

■ Is your 1,085 score the one you claimed the bounty with, or did you do it with a lower score, and then build on it later?
There was a bit of drama. I made a recording to claim the bounty – I finished the game with a score of 555, with no leeching – and sent it to him. He accused me of cheating, so I then submitted the recording to Twin Galaxies for verification, and it was verified as legit. About three weeks after that, a higher score from a third player was verified and this one was full of boomerang leeching. So, the next day – 12 January, 2009 – I recorded a new score of 1,085, which was basically the same as my previous one, but with added boomerang leeching. I didn't submit it because I don't agree that boomerang leeching is a legitimate tactic that should be allowed. However, later that year the same person who offered the original bounty took first place, so I decided to submit my, at the time, seven-month-old score. I did this because none of the other players could finish the game, and I didn't feel that their recordings were actually worthy of first place.

■ Can you explain to us what you mean by 'leeching'?
It's possible to gain an infinite number of points by hitting the projectiles that enemies throw at you, as each one is worth one point. Doing this excessively would disqualify the recording though. [The Twin Galaxies rules for the game state: "While some leeching is permitted in regards to opportunities against certain bosses (50 points maximum), too much will result in your score being disqualified."]

■ In April 2011, a new top score of 1,311 points by Saulo Bastos was verified by TG. Will you try and reclaim the record?
No, I won't. I've already finished the game many times, and seen everything there is to see. The only thing that could possibly be left to do is find an obscure point-pressing technique to exploit, but I have no interest in doing that.

■ Is it easier, or more difficult, to get a high score when playing with other players on a game like *Turtles*?
It's more difficult to score highly when playing with other players for two reasons: there are less enemies for each individual player to defeat, and it's harder to manipulate the movements and actions of each enemy because an enemy's focus tends to change from one player to another.

» Things can get pretty frantic when all four Turtles are in play.

» Hit fire hydrants to blast enemies with water.

Perils and Pitfalls

You'll have to beat these bosses to total the Technodrome

Rocksteady
An early boss in many *TMNT* games. Move up and down to dodge his gunfire, and jump to avoid his running charge.

Bebop
Similar to Rocksteady, only slightly more powerful. Attack at close range, then quickly jump away before he retaliates.

General Traag
Having previously defeated Granitor, you must face his formidable boss. He's pretty slow so keep moving around the screen.

Krang
The toughest boss in the game. Use diving kicks where you can, or if you're playing as Raphael, spam his special move.

Shredder
The chief adversary tries to confuse you with clones. Just keep plugging away with your combos and specials until he falls.

» When Rocksteady and Bebop charge, jump out of the way and they'll smash skulls. The dolts.

■ Tell us briefly about your MAME setup. What's it like?
I use my PC with a PlayStation 2 DualShock controller attached through a USB adapter.

■ How do you think the game holds up 20 years on?
I think it holds up well. The graphics are colourful and detailed, control is accurate, and it's the perfect length for this type of game. Most of the reviews say it's unfair and cheap, and that it's designed to suck quarters. Despite what these people say, it's possible to finish *TMNT* without taking any damage at all. I've never done it, but I've come close enough to know that it's possible.

■ Out of all of your records, which one are you most proud of?
My most impressive score is 10,213,610 in *Metal Slug 3*. This is a very complex game that requires nearly two hours to finish. The entire game must be memorised to point-press properly, because each segment of the game is unique and you never do the same thing twice. It took me 300 hours over a period of seven months to finally break the 10 million mark, and the feeling of satisfaction after doing that was incredible. ✱

» The skateboarding stage is not as tricky as it first appears, as it's more about dodging than attacking.

PATRICK'S SURVIVAL GUIDE

Useful tricks to help you freak the Foot Soldiers

1 ■ DO IT WITH DON
Use Donatello. It's much easier to finish the game in one credit with him, due to his long attack range. It's possible to finish with one of the other turtles, but it's considerably harder, especially against certain bosses.

2 ■ POINT TAKEN
Hit the rope that the robots fling toward you. Every hit is worth one point even though it doesn't actually damage the enemy. Also, hit the boomerangs that enemies throw at you. They're worth one point each too.

3 ■ KEY POSITION
Your character has more vertical range than the enemies, so use it to your advantage. The best way to handle an enemy is to move above or below them, then stop moving and time your attack to hit them as they move up/down to approach you.

4 ■ INCH FORWARD
To avoid being mobbed by enemies, advance through the levels gradually. By inching your way forward, you'll only spawn one or two enemies at a time, which makes the game a lot easier.

the sequels

Of the many Turtles games, these ones stay true to the original coin-op

TMNT III: The Manhattan Project
Released: 1991

The NES already had its own *Turtles* game, so the coin-op was released on the Nintendo console as *TMNT II: The Arcade Game*. This game then, from Konami, was a NES-exclusive sequel to the coin-op that was essentially an extra set of levels rather than a full-blown follow-up. The main difference was that each Turtle had their own special move. These were almost too powerful, particularly against the bosses, so to prevent the game from being a walkover you lost a little energy each time you used one. Overall, it was a fun yet derivative continuation of the coin-op. Note that there was a 1992 PC game called *TMNT: Manhattan Missions* but it has nothing to do with this game, being more of an adventure game with fighting elements.

TMNT: Turtles In Time
Released: 1991

This was the true sequel to the *TMNT* coin-op. The visuals were slicker (some lovely sprite-scaling effects were added), the action was faster and more frantic, the Turtles were blessed with new moves (included a run and shoulder barge), and everything was tuned to perfection, resulting in one of the best beat-'em-ups to grace the arcades. Home versions followed, with the SNES version renamed *TMNT IV* to remain consistent. The Mega Drive version was titled *TMNT: The Hyperstone Heist* and featured different stages. More recently, the game was given a graphical makeover and released for X360/PS3 as *Turtles In Time Re-Shelled.*

TMNT
Released: 2007

The Turtles returned to cinemas in 2007 and Ubisoft was on hand to create games based on the CGI movie. Every platform received a generic tie-in except for the Game Boy Advance, which was treated to this delightful scrolling beat-'em-up. The game introduced a few RPG-lite elements, but thankfully they didn't detract from what was essentially a straight-up, old-school brawlathon. The graphics were great too, making this one title to track down and cherish. In 2009, Ubisoft released a game for the Nintendo DS called *TMNT: Arcade Attack*, which failed to recaptured the nostalgia of the Konami coin-ops anywhere near as well as this GBA offering.

the machine

Pride of place in James Dinndorf's games room is a four-player TMNT coin-op. Here, he reveals how he transformed an old Desert Assault cab into his most wanted machine

"I'm 27 and from St. Cloud, Minnesota. Since I was a kid, I always thought it would be really cool to own an arcade machine. Growing up in the Eighties, there are many that I have fond memories of but the first one that comes to mind is *TMNT*. This game was a revelation at the time, and was at the top of my want list even before I got into the hobby.

"In 2004, the owner of an old roller-skating rink told me he had a few games to sell. He showed me a few machines, but it didn't take me long to notice a large four-player *Desert Assault* game. The game itself didn't interest me, but it had my attention because the cabinet was identical to the four-player Konami cabinets that *TMNT* came in. The game worked fine and the cabinet was in excellent shape, which was crucial to me since it meant that the power supply, monitor, and wiring all worked. I handed the owner $400 and loaded the game into my friend's truck.

"I'm very pleased with how well my *TMNT* turned out; it's one of my favourites in my collection. I get a kick out of playing it with my friends and reminiscing about the old arcade days. It's like reliving a part of my childhood."

CONTROLS

The control panel was one of the more difficult tasks during this project. I began by removing the old joysticks and buttons, followed by the control panel overlay. I found a nice NOS *TMNT* overlay and discovered that the holes for the joysticks and buttons did not match the old holes. I drilled new holes, which was tricky since some of the new holes overlapped with the old ones. After some very tedious hours, it turned out very well. *TMNT* originally used leaf joysticks, but I decided to opt for microswitch joysticks. The leaf joysticks are difficult to find, and in my experience they're not as accurate as microswitch joysticks, particularly the diagonal directions.

ARTWORK

Having good side art was extremely important to me since it's one of the most iconic elements of the *TMNT* cabinet. I was able to find a company that produced nice quality reproduction side art. It came as two giant adhesive sheets that had to be cut to fit the cabinet's dimensions.

CABINET

The cabinet is in great shape. After the old artwork was removed, it was lightly sanded and repainted. I've since repainted the front of the cabinet and coin door as well. The wood is still in excellent shape, with no noticeable damage.

PCB

I found a working *TMNT* PCB on the internet. Since *TMNT* is a four-player game and of the JAMMA standard, it uses separate wiring harnesses for the third and fourth player controls. I ended up finding those harnesses through the KLOV forums and, after a little soldering, everything wired up nicely. I've recently acquired a *Turtles In Time* PCB and am in the process of constructing a JAMMA switcher that will allow me to run both *TMNT* games in the same cabinet.

MONITOR

The monitor was the only part in need of some serious work. The colours were washed out and the picture was warped a little and over-stretched. I opted to go for a new monitor. I bought a 25-inch monitor from a company that builds arcade monitors using a universal chassis and a good TV tube. It worked flawlessly and looked 100 times better than the original monitor.

COIN MECH

Original *TMNT* machines used a dual coin door layout. However, this cabinet used a single door with four slots, which I actually like more. I decided to customise the coin slots by adding colour-coated coin slot inserts that correlate to each player's colour. I think it adds a nice touch and it's one of my favourite components of the machine.

developer Q&A

We speak to Dave Semmens, the man behind the Spectrum and Amstrad CPC versions of Teenage Mutant Ninja Turtles

Tell us when were you bitten by the programming bug?
I had a ZX Spectrum and had a dabble at BASIC but thought that there must be a better way of coding for it. I bought a Z80 assembler and taught myself to code on evenings and weekends. I was a school kid at the time.

How did you get the *TMNT* job?
I was offered the contract as Probe could convert to most platforms but really struggled to find someone to take on the Spectrum and Amstrad CPC versions.

Did you have access to the coin-op machine during development?
I travelled down to the south coast to play the coin-op. I took my artist with me and we had a day on the machine. We also had an end-to-end video of the game. It was not uncommon in the early days to do conversions after a quick play of the game and then only having photos of the screens.

How long did the conversion take, and what do you remember as being the most challenging aspects of it?
It normally took a couple of months to code a game. Programmers had their own libraries of sprite routines and scrolling routines so it was a straightforward job to get the bulk of the work done. The challenge on this game was the isometric view of the levels. I had only worked in 2D previously and this game needed X, Y and Z. The Turtles could move in and out of the screen and jump onto different height sections so it all took some working out. The other challenge was how to store all the graphics for each level. The answer was to split the sprites up into component parts so that the Turtles used the same body parts but I overlaid their individual weapons on top. The baddies also reused body parts (legs, body and heads) and this saved enough memory to fit it all in.

The first *Turtles* game was a full-colour affair, where as you opted for monochrome graphics on the Spectrum. What was the reason for this?
DS: The detail of the isometric levels and the way the sprites moved over them did not lend itself to the limited attribute colours of the Spectrum. It would have caused quite a bit of colour clash.

The first game was a huge hit for the publisher. There must have been a lot of pressure on you to come up with the goods.
The games industry was always full of pressure to deliver the goods so it became the normal way of working. We always used to have tight deadlines and it was always hard to fit as much into the conversion as the publisher wanted, so I became used to it. I remember working 48 hours straight through on some games as deadline approached. Thank God I was young, as it would probably kill me now.

Were you happy with the end result?
I was very happy with the way the game played, and we fitted all the levels in and delivered on time. That's fine by me.

Did you remain in the games industry, and what are you up to these days?
I moved onto other games and other systems including ST, Amiga, PC, Game Gear, Master System, then onto the newer home systems. I left the industry around five years ago. I had moved from programmer to senior to lead and then into team management as a producer. Finally I became development director at Acclaim in Cheltenham. Unfortunately, a third redundancy opened my eyes to the fact that it was time to find something more stable.

I currently work as a project manager for a company in Sheffield. I still have some good friends that live the games development dream, but I'm happy with my life as it is now. ✱

developer Q&A

Martin Bysh reveals why the 16-bit versions were sadly lacking

How did you end up with the job of converting *Teenage Mutant Ninja Turtles* to the Atari ST and Amiga?
After completing *Viz* for Probe Software they offered me *Turtles*. It looked like a straightforward conversion so I accepted.

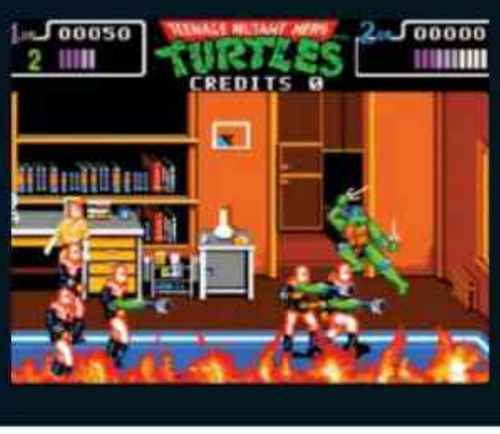
Did you work alongside Hugh Riley (graphics) and Jeroen Tel (music), or was everything done remotely?
I never met or even spoke to Hugh or Jeroen. Everything was supplied by Probe. This was typical of the Probe method.

Were the ST and Amiga versions developed simultaneously, or one after the other?
One after the other. I can't remember which I did first, but my preference would have been for the ST as that would have presented the most problems. Porting a game from ST to Amiga could take as little as a couple of weeks, whereas porting from superior hardware down would always present problems. I had specialised in such ports prior to *Viz* and *TMNT*, converting games from one to the other, often in as little as a week.

How long did it take to complete the job?
I can't remember exactly how long the development took, but it overran considerably. We ran into problems on certain Amiga 1000s with the unusual Amiga compressed disk format we were using.

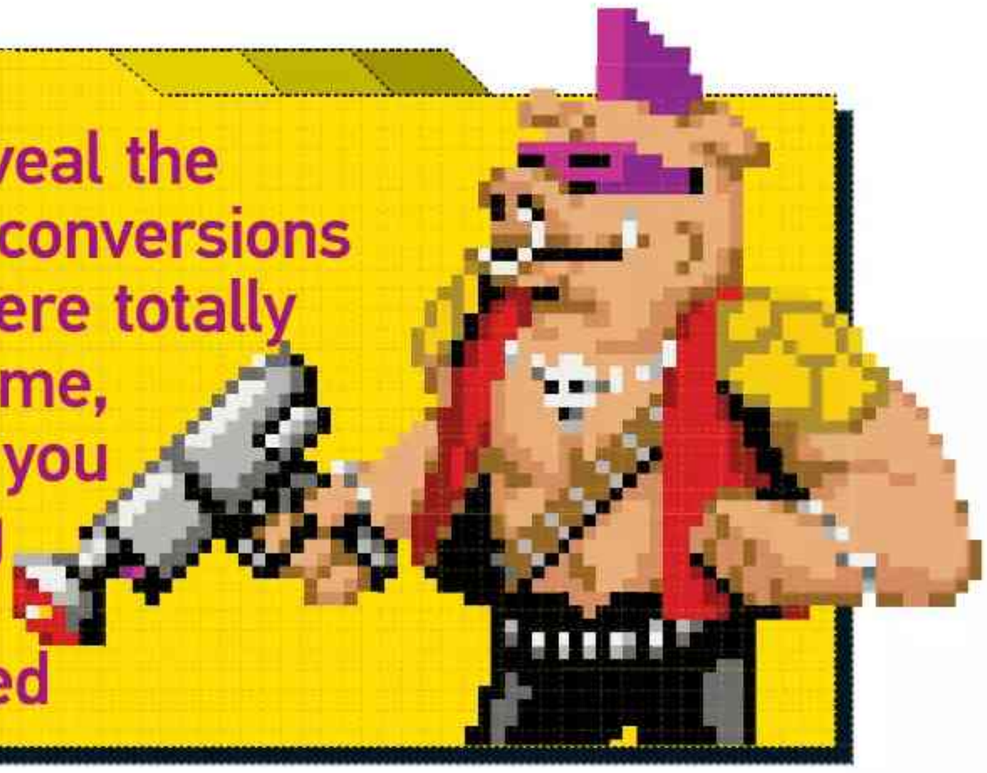
Did Probe monitor your progress and give you feedback as the development progressed?
Probe monitored progress, but not at strict intervals. The industry was beginning to mature at that point, but it was still pretty informal. The job of producer eventually emerged to bring order, but it was quite a recent addition to the games industry then. And the average producer's lack of technical knowledge and experience, combined with the independent character of the invariably self-taught programmers, artists and musicians, left them as little more than glorified messengers, passing notes between us.

How pleased were you with the finished product?
MB: Not very. This was the 13th game I'd published without rest, and I'd begun to tire of the process, which was reflected in the final product. The Probe system, while very lucrative for them, was not enjoyable for a developer. Previously I'd had much more control over products, managing the graphics and sound, or even taking a product to beta before selling it. Creating Probe games felt as dull and uncreative as the quick Amiga-ST ports I'd been doing, but whereas the ports took a couple of very well-paid weeks, *Turtles* took many months. I'd say that *Turtles* was one of the main drivers for me leaving the industry and going to university. I returned to it after uni, but by then it had become big business and after managing a large team of developers for a film tie-in, I left it about 12 years ago. With the exception of *TMNT*, it was fun while it lasted.



the conversions

We reveal the home conversions that were totally awesome, or left you feeling shell-shocked



01. NES (Best Version)

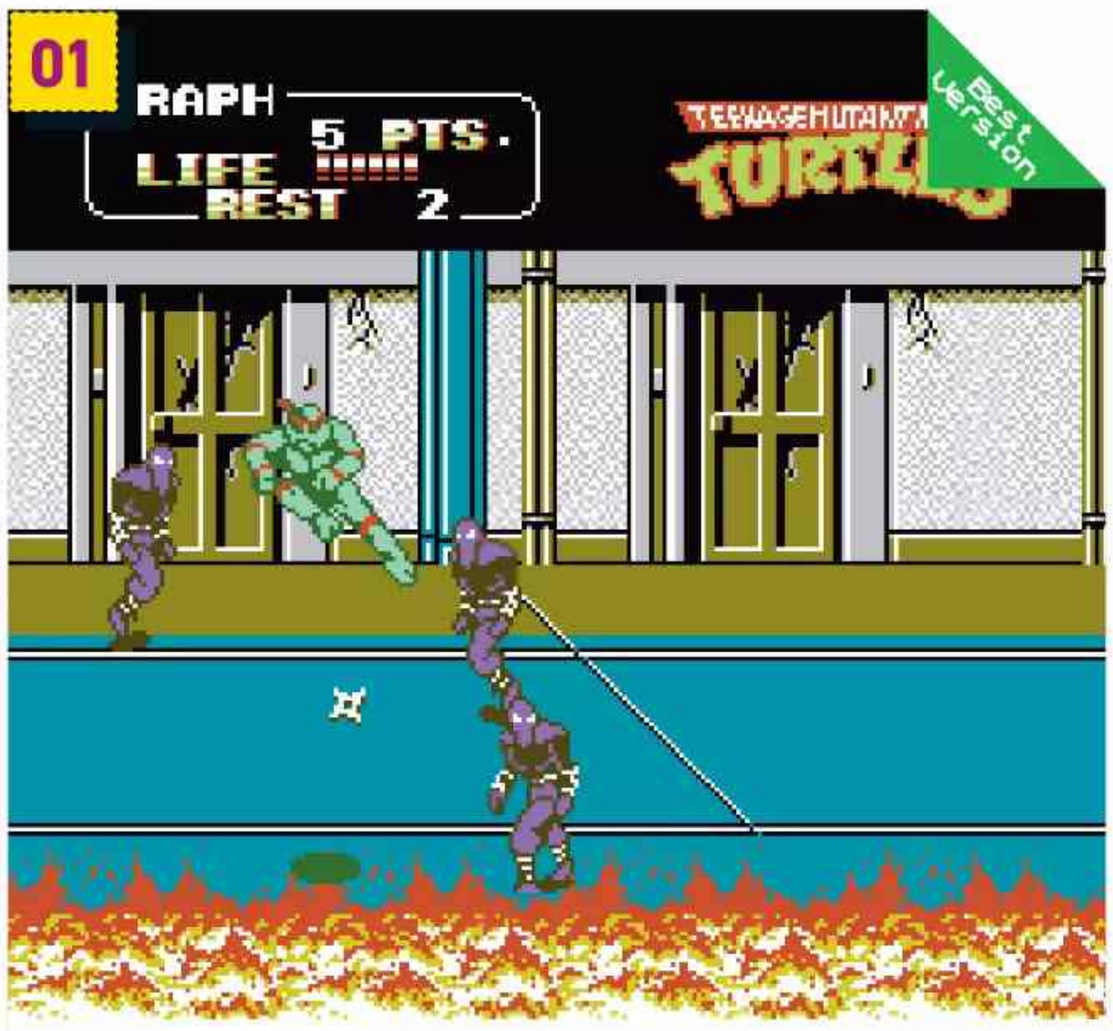
Bar the arcade-perfect Xbox Live Arcade version, we think the NES offering is the best port of Konami's arcade game. It looks the part with bright colourful visuals and well animated sprites, and also plays the part with solid collision detection and authentic representations of the original levels. Like the other home versions, it loses out due to the lack of four-player support, but it does make up for this oversight with the inclusion of two additional exclusive levels and greatly extended levels from the arcade original. A few changes are made to the boss roster (the end battle against Bebop and Rocksteady now has you fighting Baxter Stockman), but this is an otherwise excellent port.

02. Amstrad CPC

All the 8-bit computer ports are of a very high standard, but our favourite is easily the CPC offering. For starters it looks glorious, with bright, cartoony visuals, excellent animation and – shock horror – genuinely decent scrolling. Probe were masters at getting the best out of Lord Sugar's machine, and *Teenage Mutant Hero Turtles: The Coin-Op* was no exception. Like the other 8-bit ports, it lacks the killer pace and constant assault of enemies that the original coin-op offered, but this is still an excellent port that even non-CPC owners will appreciate.

03. Commodore 64

The C64 version isn't quite as good as the Amstrad offering, but



we still had a lot of fun with it. The colour scheme may not be as nifty as the CPC game, and the sprites are a lot smaller, but they remain perfectly formed and well animated. The backgrounds are of a very high standard, while the collision detection is very similar to the Amstrad offering, and a darn sight better than the ropey 16-bit offerings. It again suffers from a lack of pace and urgency, but this is mainly down to the fact that so few enemies (typically three) are ever on-screen, meaning it never feels as exciting to play as Konami's coin-op. Despite these issues, the Commodore 64 version is another worthy conversion that fans of the arcade original will still enjoy.

04. Atari ST

In some ways the Atari ST port is extremely similar to Probe's woeful Amiga offering. It's redeemed by a number of important differences though. The scrolling, while far from perfect, isn't as juddery as the Amiga offering, and there is a decent representation of the original theme tune playing along in the background. Collision detection is also slightly better that its Amiga counterpart, although it still doesn't feel as tight as the 8-bit games. It's far from perfect, and falls short of the superior 8-bit offerings, but it's a rare triumph for the Atari ST, which typically flailed behind Commodore's Amiga when it came to conversions.

05. ZX Spectrum

The Spectrum conversion of *Teenage Mutant Ninja Turtles* is another slick port, and further testament to Probe's coding skills. Unlike its peers, the Spectrum offering is in monochrome, lacking the colourful visuals that work so well on the Amstrad and C64 versions. Luckily, the Speccy offering has some great detail in its large sprites, meaning it still manages to capture the humour and larger-than-life appeal of Konami's original coin-op. Collision detection is very good, while Probe has done a good job of trying to capture all the elements of the arcade game. There are often more enemies on-screen than the other 8-bit versions, meaning that it's a little more frenetic than the Amstrad and C64 offerings.

06. PC

Teenage Mutant Ninja Turtles on the PC suffers from all the same problems that were an issue on the other 16-bit computers. It's better than the Amiga version, but on a par with the Atari ST offering. Like the other home versions it lacks the four-player support found in the original arcade game, but the two-player action is fast-paced and helped along by the sheer number of enemies that constantly attack you. It's probably our favourite version out of all the 16-bit offerings, but it's still a disappointment – more so when you put it up against the superior 8-bit versions and the fun NES game.

07. Xbox Live Arcade

Unsurprisingly, the Xbox Live Arcade version of *Teenage Mutant Ninja Turtles* was an exact port of the arcade original. Ported by conversion kings Digital Eclipse, it featured all the levels from the original arcade game, and also boasted online play, enabling you to play with up to three other people online. Released to tie in with the 2007 movie, the character screen tied in with the style of the characters in the film, but it was an otherwise perfect port and a steal at just 800 points. Sadly, the game is no longer on sale, so if you missed it on its original release, you're now out of luck.

08. GameCube/ Xbox/PS2

The worst thing about this port of *Teenage Mutant Ninja Turtles* was that you had to endure playing the decidedly average *Teenage Mutant Ninja Turtles 2: Battle Nexus* in order to unlock it. Once unlocked, it revealed itself to be an extremely authentic port of the arcade original. The only differences were some alterations to the music and the loss of many of the voice clips, presumably because Ubisoft didn't have the rights to use them.

09. Commodore Amiga (Worst Version)

Amazingly, the Amiga version of *Teenage Mutant Ninja Turtles* is extremely poor when compared to its 8-bit peers. The scrolling throughout is very jerky and off-putting, while the animation is also stiff and stilting, lacking the smooth-flowing visuals of the arcade game. It earns additional points for having far more on-screen enemies than the 8-bit games, but this simply highlights the poor collision that the Amiga port suffers from. It also lacks the extended and additional levels that were found in the NES game, making the whole thing a massive disappointment for fans of the arcade game. The final nail in the coffin was a complete lack of music in the game and extremely weedy sound effects. A disappointingly bland port that could have been a lot better.

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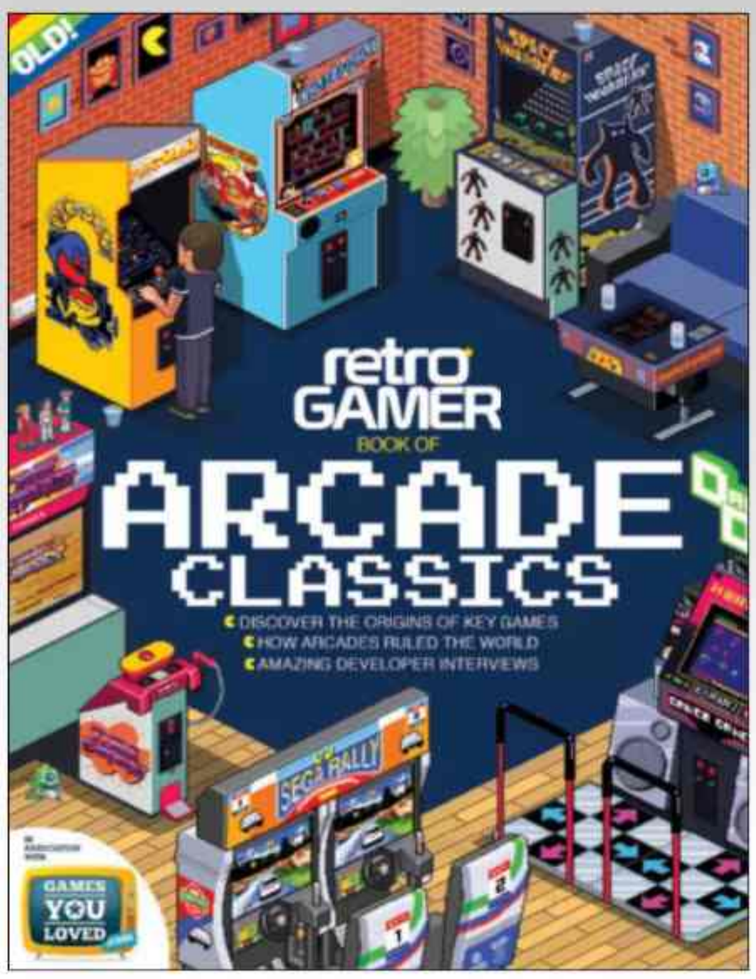

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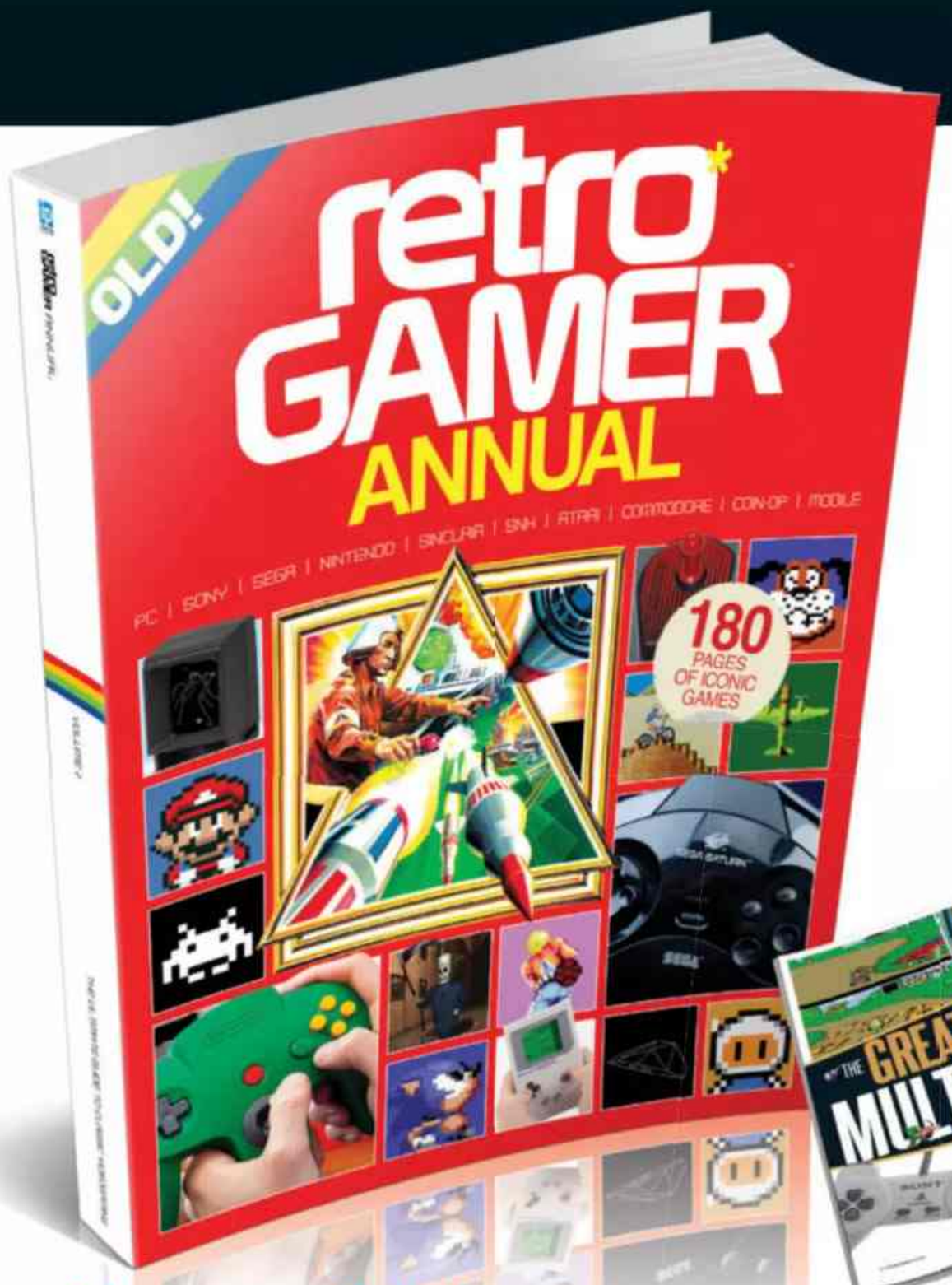

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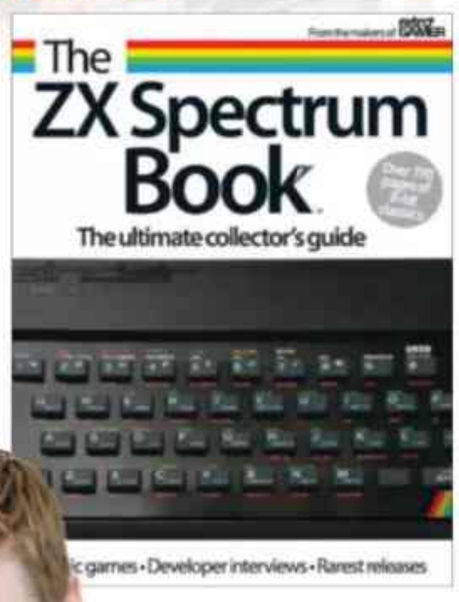

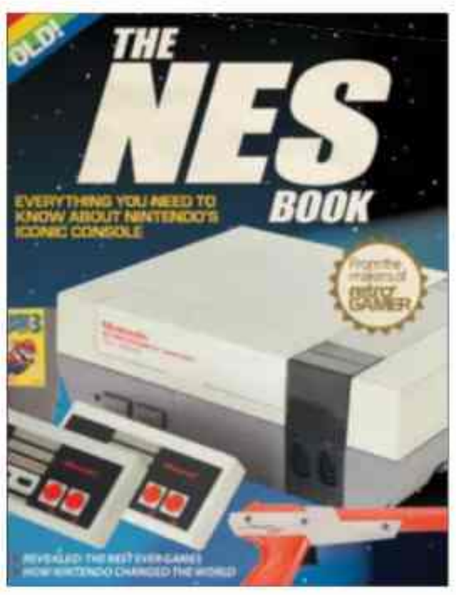

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